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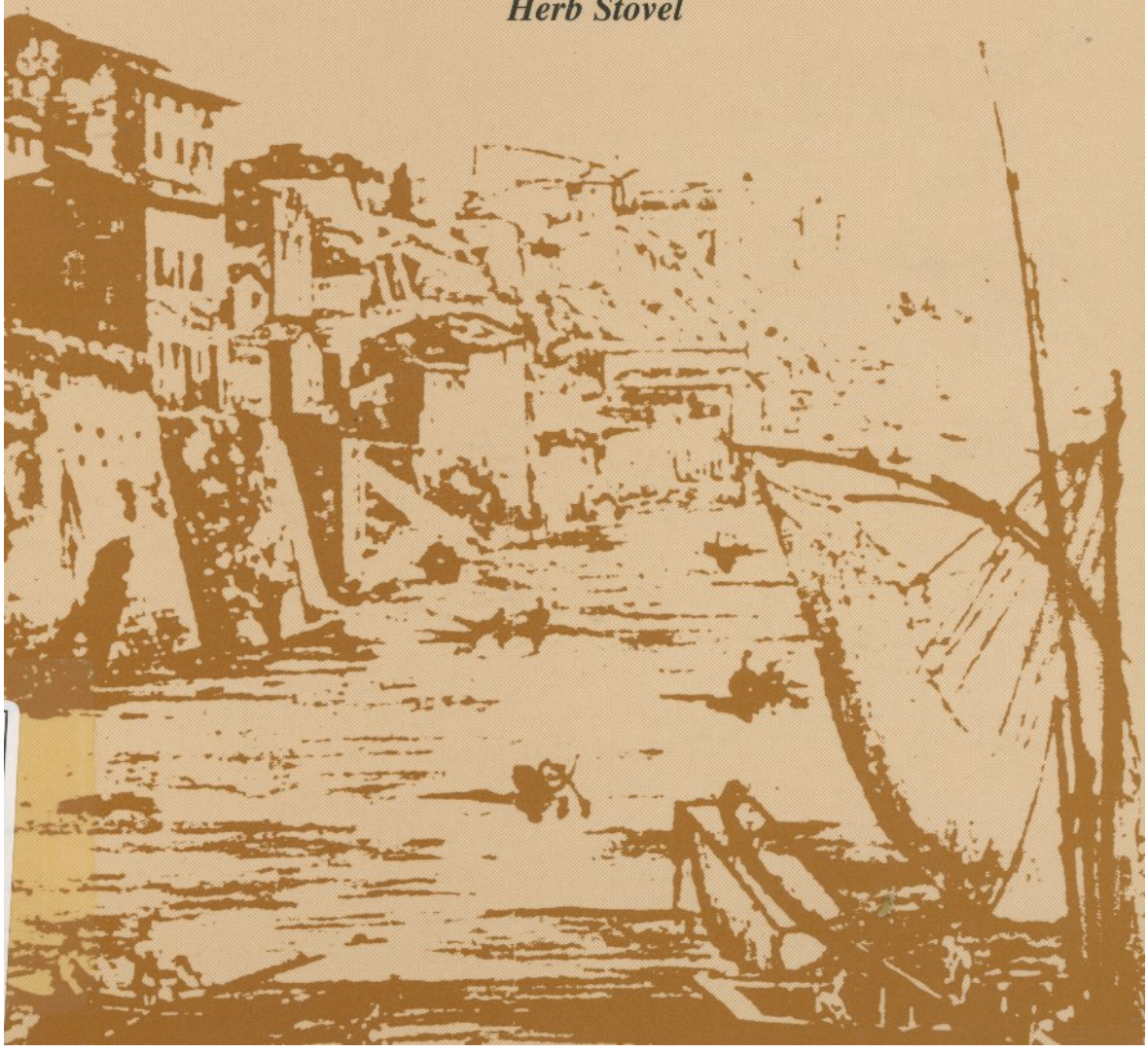
# RISK PREPAREDNESS: A MANAGEMENT MANUAL FOR WORLD CULTURAL HERITAGE

*Herb Stovel*



# RISK PREPAREDNESS:
# A Management Manual for
# World Cultural Heritage

Herb Stovel

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and Restoration of Cultural Property
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# CONTENTS

## SECTION II. DEVELOPING PROPERTY-SPECIFIC STRATEGIES TO IMPROVE RISK-PREPAREDNESS FOR CULTURAL HERITAGE

# GLOSSARY OF DEFINITIONS AND ACRONYMS

*conservation* - measures to extend the life of cultural heritage while strengthening transmission of its significant heritage messages and values

*cultural heritage* - used here as defined in the World Heritage Convention, namely "buildings, groups of buildings, sites"

*disaster* - an event whose impact exceeds the normal capacity of property managers or a community to control its consequences

*emergency* - an unexpected event which may result in loss (and which, if uncontrolled or poorly managed, may become a disaster).

*hazard* - a particular threat or source of potential damage (fire, floods, earthquakes are types of threats)

*mitigation* - means to alleviate or reduce the impact of disaster

*preparedness* - planning efforts to reduce the risk and consequences of disaster; also includes planning efforts to prepare for response and recovery

*recovery* - measures taken to overcome physical, social, environmental and cultural losses during disaster, and to minimize the likelihood of future occurrences

*risk* - hazard x vulnerability; i.e., the degree to which loss is likely to occur, as a function of the nature of particular threats in relation to particular physical circumstances and time

*vulnerability* - estimation of the level of loss associated with particular hazards

CRATerre - International Centre for Conservation of Earthen Architecture

DOCOMOMO - Documentation and Conservation of the Modern Movement

FEMA - Federal Emergency Management Agency, USA

GCI - Getty Conservation Institute

IATF - Inter-Agency Task Force (for improving risk-preparedness for cultural heritage)

ICA - International Council on Archives

ICBS - International Committee of the Blue Shield

ICCROM - International Centre for the Study of the Preservation and Restoration of Cultural Property

ICOM - International Council of Museums

ICOMOS - International Council on Monuments and Sites

ICR - Istituto Centrale per it Restauro [Central Restoration Institute], Italy

ICRC - International Committee of the Red Cross

IDNDR - International Decade for Natural Disaster Reduction

IFLA - International Federation of Library Associations and Institutions

IUCN - World Conservation Union

NIC - National Institute for the Conservation of Cultural Property, USA

SAARC - South Asian Association for Regional Cooperation

TICCIH - The International Committee for Conservation of the Industrial Heritage

UNESCO - United Nations Educational, Scientific and Cultural Organization

WHC - World Heritage Centre

# ICCROM PREFACE

Publication of *Risk-Preparedness: A Management Manual for World Cultural Heritage* by ICOMOS-ICCROM-UNESCO continues a process put in place in 1983, only five years after the first inscriptions to the World Heritage List. At that time, increasingly cognisant of the need to strengthen the management skills of those responsible for World Heritage sites, UNESCO's Cultural Heritage Division gave ICOMOS and ICCROM a mandate to develop a set of management guidelines for use by site officials.

Sir Bernard Feilden, Director Emeritus of ICCROM was asked to write the document. After extensive review and the eventual involvement of ICCROM collaborator Jukka Jokilehto, *Management Guidelines for World Cultural Heritage Sites* was published in 1993.

Now translated into a dozen languages, and a revised edition imminent, these popular *Guidelines* have fostered strong interest in developing a series of related management guides to explore in depth the various component subjects treated by the Feilden and Jokilehto opus.

Herb Stovel, author of this Risk-Preparedness Manual, also prepared a Management Guide for World Heritage Towns for the first meeting of the Association of World Heritage Cities in July 1991, soon to be reprinted by ICOMOS-ICCROM-UNESCO. In 1993, Robertson Collins - on behalf of US-ICOMOS and American Express - prepared a *Tourism Management Guide for World Cultural Heritage Sites*. Meanwhile, planning continues for similar volumes in other, related, subject areas, such as recording, documentation and information management; cultural landscape management; etc.

This *Risk-Preparedness Manual for World Cultural Heritage* recognizes the increasing importance accorded this subject in the management process, but also the increasing commitment being made to preventive approaches in the wider conservation field. ICCROM is proud of the contribution it is making to the advancement of management practices for world cultural heritage sites through its involvement in commissioning and publishing these manuals. It is confident that this Manual will constitute a valuable addition to these long-standing efforts, and soon become a major tool in managers'efforts to heighten risk-preparedness for all sites of cultural heritage importance.

Marc Laenen
Director-General

# ICOMOS PREFACE

As we move our efforts in conservation towards giving a sustainable dimension to development, as we move toward mainstream acceptance of the place of cultural heritage conservation in our evolving global society, our professional concerns have inevitably broadened. ICOMOS has committed itself in the current triennium (1996-1999) to promoting 'the wise use of heritage' as a part of repositioning the movement on social and economic development objectives.

Risk-preparedness is a critical part of a wiser use of our cultural environments. Risk analysis and mitigation ensure better use of scarce resources, and optimal conditions for extending the life of cultural property. And a cultural-heritage-at-risk framework offers those concerned with the conservation of the built environment the chance to fully root their efforts in a concern for the preventive for the first time in the history of the movement.

While these interests are not new in conservation, the current thrust to consolidate thinking and practices has been led by past ICOMOS Secretary-General, Herb Stovel, who has authored this Manual. He chaired the first round table in the 1990s, to bring all of the key international organizations together to debate modes of collaboration. ICOMOS Risk-preparedness Coordinator Leo van Nispen has led the Inter-Agency Task Force (including UNESCO, ICCROM, ICOMOS, ICOM, ICA, IFLA, Council of Europe and many others) in a series of collaborative measures and actions over the past five years. This Manual is a tangible demonstration of the new interest in collaboration among international partners.

The financial support of the World Heritage Committee has made this Manual possible, starting with the extensive consultations concerning its outline and content. By providing this support, the Committee has proved once again the important role of the World Heritage Convention as a powerful instrument offering significant benefits for cultural heritage worldwide, for the Manual - and the debate which it invites - will be available to managers involved with built heritage at all levels.

The Manual builds on existing experiences in developing risk-preparedness guidelines or handbooks for site managers; it is intended to assist readers to draw from generic models and advice in order to develop their own site-specific guidelines. While the Manual was built through early consultation with Inter-Agency Task Force members in the planning stages, and reviewed by a small number of interested experts from both ICOMOS and ICCROM, it is nevertheless but a beginning. It is hoped that the dozen case studies of 'best practice' in all areas of the field will be supplemented in a future addition by many more as-yet-unknown

examples of excellence. If you have experiences to share, or lessons learned, please do not hesitate to contact us and pass on your information.

Jean-Louis Luxen
ICOMOS Secretary-General

# ACKNOWLEDGEMENTS

This manual was made possible by a financial contribution from the World Heritage Committee, and the fullest collaboration in its production of staff of ICCROM, ICOMOS and UNESCO's Cultural Heritage Division and World Heritage Centre.

The author particularly wishes to recognize the leadership of Leo van Nispen, ICOMOS' Blue Shield Coordinator, who initiated the project, the many constructive criticisms brought forth by colleagues during several Inter-Agency Task Force round tables (and the financial support of the Cultural Heritage Division within UNESCO which made the round tables possible), and the draft document's principal reviewers: Leo van Nispen, Ann Webster Smith and Henry Cleere of ICOMOS, Jukka Jokilehto, Joseph King and Andrea Urland of ICCROM, and Etienne Clément, Herman van Hooff and Hideo Noguchi of UNESCO.

# Chapter 1
# INTRODUCTION

## 1.1 WHY A MANUAL ON RISK-PREPAREDNESS FOR CULTURAL HERITAGE?

Events like the earthquake in Assisi on 26 September 1997 focus the eyes of the world on the ever-present risk surrounding significant cultural heritage. The power of modern media is able to draw citizens in all parts of the world into the human drama being played out on site; it amplifies the sense of loss experienced locally and heightens identification with those affected. We are immediately ready to give our time, our money, our energy, our fullest support to measures to repair damage, and to improve prevention strategies to avert future loss. However, once the event is past, once the media's review of the what and the why has faded from memory, our concern for the totality of our cultural heritage - no less at risk than those tragic examples of visible losses that grip our attention - begins to fade.

We respond to tragedy when it occurs; we respond with energy, compassion and visceral frustration in the face of immediate need, but we are reluctant to extend our capacity for event-specific response to embrace the larger processes for which we bear responsibility. We are reluctant to commit resources seriously to improved preparation: not just for earthquakes in Assisi or Kobe, not just for hurricanes in Savannah, but for risks of all kinds, in relation to all forms of cultural heritage. Embracing this larger perspective demands a fundamental re-thinking of the essence of the conservation approach developed for our built heritage, a conservation approach developed globally over the last two centuries.

That re-thinking is now under way. Stimulated by the high visibility of the losses accompanying recent human depredations (the Gulf War, the civil war in ex-Yugoslavia, the looting of Angkor, etc.) and natural cataclysms (floods in Quebec's Saguenay, earthquakes in California, fires in Australia and the Amazon, etc.), many heritage agencies and professionals have been clamouring throughout the 1990s for conservation strategies focused on prevention, rather than on periodic, curative interventions.

While an interest in prevention has long motivated conservators of museum objects, collections and archaeological sites, built heritage conservation professionals - given their over-riding preoccupation with the fundamental utility of heritage buildings - have oriented their conservation activities to episodes variously involving repair, upgrading, restoration and rehabilitation. This approach has ensured development of a body of doctrine conceptually oriented to guiding

curative or restorative interventions, but less well suited to guiding elaboration of strategies for prevention.

The *Blue Shield* movement (borrowing the emblem of the 1954 Hague Convention) launched by the International Council on Monuments and Sites (ICOMOS) in October 1992 sought to re-orient conservation attitudes and practices to reflect the increasing concern of built heritage professionals for these issues. Over the ensuing five years, an Inter-Agency Task Force involving ICCROM, UNESCO, ICOMOS, ICOM and many others has sought to coordinate the activities of the Task Force and its individual members in five key areas: funding; emergency response; training and guidelines; documentation; and awareness. The most tangible result to date of the Inter-Agency Task Force's efforts has been the creation in July 1996 of the International Committee of the Blue Shield (ICBS), for coordinating emergency response efforts on behalf of ICOMOS, ICOM, ICA and IFLA.

Discussions at Inter-Agency Task Force meetings and in related forums have crystallized a number of important attitudinal shifts among conservation professionals. The perception has been overturned that disasters were a phenomenon of limited interest, given their rarity; it is now accepted that in the life of sites or places of cultural heritage importance, the negative impacts of those brief moments of disaster far outweigh the cumulative impacts of daily wear and tear. A second, related, realization has been recognition of the importance of adopting a new conservation paradigm focused on prevention: a cultural-heritage-at-risk framework. It has come to be understood that this framework offers a more holistic outlook than conventional approaches to conservation; an outlook viewing all sources of deterioration as linked in a single continuum, from the daily attrition of use at one extreme, to the cataclysmic losses occasioned by disasters or conflicts at the other.

While the conservation movement has been moving to strengthen its activity in this area - in great part as a result of the awakening of interest in risk-preparedness described above - those entrusted with general responsibility for emergency preparedness in communities have been moving in parallel to increase the attention given to cultural heritage. As with the shifts in emergency preparedness taking place among conservation professionals, a number of key attitudinal changes can be detected among disaster-relief officials. Emergency-preparedness officials, once reluctant to accord priority to protecting cultural heritage in the face of threats to life, property and the environment, now recognize cultural heritage as a reflection of past lives, an extension of efforts to save present lives. With this understanding, disaster-response officials have demonstrated the practical benefits of collaboration: fire fighters, for example, have demonstrated their willingness to moderate interventions to historic fabric when attempting to control fires; in turn, they expect conservation professionals to accept preventive measures (such as sprinkler systems) which, while having a modest negative impact on heritage character, dramatically reduce the risk of loss in the event of fire.

The convergence of concerns in the two fields has already resulted in a number of important national and international initiatives. This Manual is an example of one such initiative: prepared by ICOMOS with the support of UNESCO's World Heritage Committee, and edited and published by ICCROM, the Manual for *Risk-Preparedness for World Cultural Heritage* is intended to play a key role in assisting property managers to better protect the heritage attributes of the properties in their care in the face of risk.

## 1.2 RISK-PREPAREDNESS IN THE CONTEXT OF THE WORLD HERITAGE CONVENTION

### 1.2.1 The benefits of the Convention

The World Heritage Convention, more properly the *Convention Concerning the Protection of the World Cultural and Natural Heritage,* was adopted by the Seventeenth Session of the General Conference of UNESCO in Paris on the 16th November 1972. The Convention is one of UNESCO's singular success stories; as of early 1998, over 150 countries had adhered to the Convention and over 500 sites had been placed on the World Heritage List. The List has served as a remarkable instrument for celebration of the shared heritage of humankind through its exploration of the "exceptional universal value" of its sites.

While the Convention's attention focuses primarily on those sites inscribed on the List, all of the world's heritage - from the highly significant to the modest

- benefits, through association.

The Convention also provides other significant benefits:

- the lessons gained from World Heritage sites and efforts to improve their state of conservation are transferable to all sites of cultural heritage value;
- the Convention promotes the highest conservation standards at the national level in countries adhering to it, to ensure adequate care for significant elements of national heritage. Articles 4 and 5 of the Convention in part note:

*"to ensure that effective and active measures are taken for the protection, conservation and presentation of the cultural and natural heritage situated on its territory, each State Party to this Convention shall endeavour, in so far as possible, and as appropriate for each country:*

- *to adopt a general policy which aims to give the cultural and natural heritage a function in the life of the community and to integrate the protectiono that heritage into comprehensive planning programmes;*

- *to set up within its territories, where such services do not exist, one or more services for the protection, conservation and presentation*

*of the cultural and natural heritage with an appropriate staff and possessing the means to discharge their functions;*

*- to take the appropriate legal, scientific, technical, administrative and financial measures necessary for identification, protection, conservation, presentation and rehabilitation of this heritage."*

- the Convention is a remarkable instrument of international cooperation; it is built around efforts promoting collaboration between countries, agencies and individuals in order to celebrate significant aspects of our common humanity, rather than efforts to control undesirable behaviour or actions; and
- the challenge of both ensuring equitable and consistent evaluation of nominations and of resolving the conservation dilemmas of World Heritage sites provide continuing inputs to the process of scientific development in the field.

### 1.2.2 Operation of the Convention

The Convention's provisions are guided by its *Operational Guidelines,* which are reviewed regularly. These describe various procedures and methods for implementation of the Convention.

The Convention's work is carried out by the *World Heritage Committee,* whose members are elected from among States Parties to the Convention. The Committee, consisting of representatives of 21 States Parties, is itself managed by seven of its members, constituting the *World Heritage Bureau.* UNESCO provides a secretariat - The World Heritage Centre (WHC) - to manage the day-to-day activity of the Committee, and to facilitate implementation of its recommendations. This administrative unit was created in June 1992.

The Convention also provides for advisory services to be provided to the Committee by Advisory Bodies: ICOMOS and ICCROM for cultural heritage, and the World Conservation Union (IUCN) for natural heritage. ICOMOS and IUCN, in their role as independent non-governmental organizations (NGO s),provide evaluations of sites nominated for the World Heritage List, and assist both in monitoring and reporting on site's state of conservation, and in providing appropriate technical assistance. ICCROM assists the Committee in guiding reflections on educational and training needs, in ongoing technical cooperation and in development of manuals and guidelines to improve management for sites inscribed in the List. This present manual is one in a series of management guides initiated by ICCROM in 1993 with the publication of *Management Guidelines for World Cultural Heritage Sites,* by Feilden and Jokilehto. All of the Advisory Bodies also play key roles in assisting with the intellectual development of the Convention. This often occurs in partnership with others; ICOMOS for example works with the International Committee for the Conservation of the Industrial Heritage (TICCIH) in the area of industrial heritage, and with DOCOMOMO in the area of modern architecture.

ICCROM works closely with the International Centre for Earth Construction (CRATerre) in dealing with earthen architecture.

The *Operational Guidelines* describe the basis on which sites are to be judged by ICOMOS and the World Heritage Committee for inclusion on the List. In essence, sites must satisfy criteria in three equally important areas:

- sites must be of *outstanding universal value;*
- sites must meet the *test of authenticity;* and
- sites must be adequately protected.

In other words, the World Heritage List includes not just properties of exceptional heritage value, but well-protected properties of exceptional heritage value.

To be considered of *outstanding universal value,* the Committee must find that a site meets at least one of six cultural criteria, described in Paragraph 24 of the *Operational Guidelines.*

Sites must:

1. *represent a masterpiece of human creative genius; or*

2. *exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town planning or landscape design; or*

3. *bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared; or*

4. *be an outstanding example of a type of building or architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history; or*

5. *be an outstanding example of a traditional human settlement or land-use which is representative of a culture (or cultures) under the impact of irreversible change; or*

6. *be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance (the Committee considers that this criterion should justify inclusion in the List only in exceptional circumstances, and in conjunction with other criteria, cultural or natural).*

Sites that meet criterion six alone are to be admitted only exceptionally to the List. Here, the Committee believes, it important to link the intangible associations of criterion six with tangible values in the property's physical forms and expressions, evaluated by other cultural criteria.

As noted, in addition to possessing universal cultural value, properties must also meet the *test of authenticity.* Authenticity is defined in the *Operational Guidelines,* Paragraph 24) in fairly broad terms, reference being made to authenticity of design, materials, workmanship or setting:

- *materials:* "original building material, historical stratigraphy, evidence and marks made by impact of significant phases in history, the patina of age";
- *workmanship:* "substance and signs of original building technology; techniques of treatment in materials and structure";
- *design:* "elements or aspect in which the artistic and functional design of the object and its setting are manifest (the original meaning and message of the monument, the artistic and functional idea, the commemorative aspect)"; or
- *setting:* "site and setting related to periods of construction, *in situ* landscape, townscape, group value."

Cultural landscapes are expected to maintain their authenticity of character.

The *Nara Document on Authenticity* suggests the value of extending the test of authenticity to include authenticity of *function, tradition* and *spirit.*

Finally, properties that are deemed to be of universal value, and able to meet the test of authenticity, are also required to be protected by adequate management, legislative and/or traditional mechanisms.Generally speaking,this involves examination of the nature of legislative protection at relevant levels of government, of administrative arrangements for effective management, and of traditional measures in place to maintain or look after a property.

### 1.2.3 Cultural-heritage-at-risk relative to the Convention

The World Heritage Convention has always provided a framework within which a cultural-heritage-at-risk perspective could be applied. The Convention provides for maintenance of a *List of World Heritage in Danger,* signalling those properties in need of extraordinary measures and international collaboration to ensure their survival.

While to date only a small number of properties of cultural and natural value have been inscribed on the List of World Heritage in Danger, their state of conservation generally occupies a significant proportion of the World Heritage Committee's annual meetings and focuses attention on the nature of the particular hazards threatening these properties, and possible measures to ameliorate the threats.

More recently, efforts by the Committee to focus attention on *monitoring* issues have increased attention paid to risk-preparedness. While use of the word monitoring has proved troublesome in discussion, the Committee has manifested a strong interest in being aware of the current state of conservation of sites on the

List, and of threats to these sites. The Twenty-year Review of the Committee's activities (published in 1992) focused on strengthening action in several areas relevant to improving risk-preparedness. Of the five objectives defined by the review for the purpose of evaluating the Convention's effectiveness, two touch this point. The Committee resolved:

- "To promote the adequate protection and management of the World Heritage Sites
  - Take specific steps to assist in strengthening site protection and management;
  - Take appropriate actions to address threats and damage to sites;
- To pursue more systematic monitoring of World Heritage Sites
  - Define elements and procedures for monitoring;
  - Cooperate with State Parties and competent authorities on regular monitoring work."

Expert meetings in 1992 and 1993 on issues of monitoring focused attention on a number of related concerns important to improving risk-preparedness for cultural heritage:

- monitoring since the 1992 Review has been understood as *"a systematic process of cooperation,"* involving close collaboration among States Parties, WHC and the Advisory Bodies;
- however, given continuing negative perceptions concerning the objectives of monitoring (for some, an implied focus on policing, on external control, on loss of national sovereignty), emphasis has been given increasingly to use of `reporting' to describe efforts to better understand the state of conservation of sites. In addition, a distinction has been drawn between reactive monitoring (i.e., prompt response to perceived threats) and systematic monitoring (a comprehensive report on the state of conservation of a site).
- discussions have focused on establishing baseline data from which changes - for better or worse - can be measured on properties. This concept is useful in the 'environmental impact assessment' model used to evaluate the impact of proposed alterations to a property, but is equally valuable in efforts to work within a framework concerned with assessing the risks associated with potential hazards. It also encourages stronger efforts to record and document cultural heritage properties, in order to provide a permanent and reliable benchmark reference for the measurement of change.

Article 5 of the Convention, previously noted as promoting strengthened efforts at the national level for protection of the national heritage, also directs attention to the need to better anticipate and deal with risk and hazards, noting the need to:

*develop scientific and technical studies and research and to work out such operating methods as will make the State capable of counteracting the dangers that threaten its cultural or natural heritage.*

Discussions within the World Heritage Committee's annual meetings continue to raise awareness concerning the ever-present and growing threats to cultural heritage, and to focus attention on the need for strong and well-coordinated counter-measures. The Committee's financial support for the production of this present Manual is a tangible demonstration of their commitment to appropriate measures to improve risk-preparedness for cultural heritage.

## 1.3 DEVELOPMENT OF THE MANUAL

This Risk-Preparedness Manual was conceived as a practical tool to improve the capacity of cultural-heritage managers at all levels to better prepare for, respond to and recover from disasters of natural or human origin. It is part of a package of tools and initiatives promoted collectively and individually by the members of the Inter-Agency Task Force (IATF) for Cultural-Heritage-at-Risk, set up following meetings organized by ICOMOS in Paris in October 1992.

These meetings were held as a response to the frustrations of conservation professionals worldwide concerned with the visible losses of cultural heritage occurring in the late 1980s and early 1990s as a result of conflicts in the Gulf and in ex-Yugoslavia, and hurricanes, earthquakes and landslides in the Americas and in Asia. While these types of events and their consequences for human life and cultural heritage were not new, their heightened visibility provoked a strong emotional response among many conservators. They wrote in great numbers to ICOMOS, to ICOM and to UNESCO, asking "What can we do?"

Prompted by the palpable expression of their concern, ICOMOS determined to launch a movement to improve the ability of international organizations to respond to disasters. A first round-table discussion was convened in October 1992 to discuss possible means to achieve desirable improvements. It has been followed by four round-table discussions at approximately annual intervals. These round-tables have enabled the IATF for Cultural-Heritage-at-Risk to define an action agenda, and at intervals to verify progress towards the defined objectives.

The initial discussions of the IATF defined a framework for analyzing and defining actions needed in the field. Five areas of potential activity were identified: funding; emergency response; documentation; training and guidelines; and awareness. Potential activity in each area was looked at in terms of before (preparedness), during (response) and after (recovery) disasters. In addition to the action framework initially defined, the IATF also focused its attention on improving coordination and cooperation among the many agencies and groups involved with these issues in both the cultural heritage field and in the risk management field. The Inter-Agency Task Force's framework is summarized in the matrix in Table 1.

| | Before (Preparedness) | During (Response) | After (Recovery) |
|---|---|---|---|
| Funding | | | |
| Emergency response | | | |
| Documentation | | | |
| Training and guidelines | | | |
| Awareness | | | |

This Manual has been developed within the framework's 'training and guidelines' efforts, as a practical initiative to enhance the capacity of managers to better care for cultural heritage at risk. It was developed on the basis of discussions in a number of the IATF 's working sessions (See Appendix C), particularly the round-table meeting of 3 April 1996 in Paris, which was specifically devoted to the task. Approximately 40 representatives from more than 15 agencies participated in a day's brainstorming to develop a suitable philosophical orientation and format for the Manual. These discussions and others within the subsequent international meetings in Quebec and in Kobe confirmed the importance of the following objectives in developing the Manual.

- The Manual would be concerned with all forms of Cultural Heritage covered in the World Heritage Convention - *monuments, groups of building, (or ensembles), sites* - but would integrate concern for the objects found within historic structures; movable and immovable heritage should be treated as one entity, closely linked in the same continuum.
- The primary goal of the Manual would be that of assisting managers of property or buildings to develop their own site-specific risk-preparedness guidelines, adapted to their particular economic, political and cultural circumstances.
- Given the emphasis evinced in the IATF meetings, and in the international meetings in Canada and Japan, for integrating concern for cultural heritage within existing disaster-preparedness infrastructures, this Manual, rather than proposing that managers develop disaster-preparedness approaches for cultural heritage to add those already in place for people, property and the environment, emphasizes the value of integrating measures for the protection of cultural heritage within existing emergency planning mechanisms.
- The primary focus of attention within the Manual should be the development of an overall prevention and mitigation strategy for heritage properties. The strategy should integrate all necessary administrative, operational and technical measures and should be developed and implemented by site managers

in consultation with municipal officials responsible for security and protection. Such a strategic analysis would be developed independently of measures which governments or their representatives might embrace to improve effectiveness and collaboration in the field. The strategy would integrate all possible areas of action through which conditions for the protection of cultural heritage at risk could be enhanced, not just measures focused on improving response.

- Attention would be given in the Manual to complementary efforts at the national level to improve the framework for risk preparedness for cultural heritage, and which would therefore improve conditions at the site level.
- the Manual would be oriented to appropriate prevention and mitigation measures for the most prevalent hazards (i.e., fire, flood, earthquake and armed conflict) rather than towards site-specific needs of the different types of cultural heritage (e.g., monuments, landscapes, historic districts). Major hazards would be treated in sequence in the Manual. Disaster-Preparedness Manuals developed for particular sites would require the integration of strategies proposed for each hazard important for the site; the degree and manner of integration required would be a function of the site's particular situation and the nature of its significant hazards.
- The Manual's recommendations and proposals would focus primarily on those relevant for heritage properties and structures in single management; recommendations for historic districts, cultural landscapes and other entities in multiple ownership would be added where useful. It was nevertheless expected that for the most part managers would extrapolate from the single structure or property model examined to address their own complex properties.
- While the Manual would be meant to be used primarily by the site's managers, given the great diversity of cultural heritage and contexts the Manual should attempt to cover, it was been intended that its materials would also be relevant for the great range of administrators, policy-makers, site officials and consultant professionals whose decisions in concert affect the well-being of a site.
- Although explicitly intended to benefit cultural sites inscribed on the World Heritage List, the Manual's advice and recommendations would be designed to be relevant for all sites of cultural heritage value; while not directly concerned with sites of natural heritage value, the Manual was also intended to integrate insights pertinent to natural heritage where appropriate.
- The Manual should address disasters of both human and natural origin; while these differ vastly in their psychological impact, they are often similar in their physical consequences and benefit from common planning for improved preparedness and recovery.

Given the great amount of research already carried out to define appropriate measures in many areas of this field, this Manual was developed through efforts

to identify and bring together relevant recommendations already developed, and to 're-package' them within the Manual's self-help framework. Its materials are derived from discussions held during IATF meetings and from case studies and discussions held during international meetings on the subject in Quebec City, Canada; Kobe, Japan; Sofia, Bulgaria; and Washington, D.C., USA. It also draws strongly on the many already-published guideline documents concerning disaster-preparedness for cultural heritage of one kind or another; in particular, it uses the check-lists developed in the ICOMOS *Guidelines for National Blue Shield Committees: A Site Preparedness Plan of Action* (edited by Nathalie Martin for ICOMOS in June 1995) as a key reference. The materials used as primary references are listed in the sources (Chapter 12).

It should also be understood that this Manual is not intended to provide technical answers for particular technical questions or problems: rather, it is designed to assist readers to use generic planning frameworks and analytical processes to develop appropriate strategies and plans to improve provisions for risk-preparedness for cultural heritage. It may be understood as offering a form of a 'do-it-yourself approach to problem solving; its framework elements, its principles and its lists of issues and concerns may be understood to provide a series of checklists useful for managers seeking to improve the care - in a risk-preparedness context - that they provide for the heritage qualities of the properties in their care. Its advice should always be adapted to the particular context in which it is applied, and any temptation to apply unthinkingly the Manual's principal approaches as problem-solving formulae must be resisted. The Manual is intended to assist managers to develop and refine use of their own professional judgement in evaluation of the various factors relevant in improving risk-preparedness measures for properties of cultural heritage value.

## 1.4 A USER'S GUIDE TO THE MANUAL

Although this Manual has been designed primarily to assist those responsible for the management of properties of heritage value to effectively integrate concern for heritage values in the development and implementation of property-specific risk-preparedness strategies and guidelines, it has also been designed to assist individuals working within other contexts whose actions could have an impact on a property. It is hoped that the Manual could also help these individuals improve their understanding of risk-preparedness issues, and consequently enhance their ability to aid particular properties by actions taken within their spheres of responsibility.

The manual has therefore been designed to assist conservation professionals to better understand the basic concepts of risk-preparedness; it has been designed to introduce to risk-preparedness professionals the basic ideas and concepts which underlie the conservation field; and it has been designed to help policy-makers and

administrators working at local, regional and national levels to better integrate concern for cultural heritage in existing risk-preparedness planning.

As a consequence, not all sections of this manual will have equal importance or value for its various readers. Nor is it necessary to read the various chapters of the Manual in the order presented in order to be able to effectively utilize their contents.

The following provides a brief description of the purpose of the remaining chapters to aid readers to more quickly focus on those materials of greatest immediate interest and utility for their particular purposes.

Chapter 2, in part intended to provide general background, focuses on some of the broad obstacles faced within the conservation and risk-preparedness fields in trying to improve risk-preparedness for cultural heritage, and suggests how these may be overcome.

Chapter 3, expected to be of more direct interest to property managers, defines ten principles that should apply in trying to devise and improve risk-preparedness strategies and plans for the benefit of cultural heritage.

Chapter 4, aimed at helping property managers to begin to analyze and improve planning for cultural heritage at risk, provides both a planning framework which defines elements of effective plans and planning processes for cultural heritage at risk and a set of planning concerns applicable to the various types of heritage being treated in this Manual.

Chapters 5-10 are essentially the core of the Manual. Intended primarily for property managers, they look in detail at the various hazards that may be significant and their implications for developing a property risk-preparedness plan. Chapter 10 suggests how to develop guidelines for particular properties, based on the heritage values of the property, and the various prevalent risks.

Chapter 11 is probably most applicable to administrators. Administrators are here taken to be that group who set the policies that define the local, regional and national parameters within which property managers have to work in achieving their objectives. The section looks at the various means by which such policies and related practices can be improved.

Chapter 12, intended for all readers, offers an introduction to key sources in the field to assist individuals to improve their familiarity with the issues that most interest, or are most immediate to, them.

Appendixes A-D give the full texts of key documents mentioned in the text. A dozen case studies touching heritage of all types in a variety of circumstances are also given. The goal has been to present success stories, and to offer associated lessons to readers for re-use and adaptation.

Chapter 2

# THE IMPORTANCE OF RISK-PREPAREDNESS FOR CULTURAL HERITAGE

## 2.1 ATTITUDINAL OBSTACLES: ARGUMENTS AND COUNTER-ARGUMENTS

Current initiatives at international, regional and local levels to improve risk-preparedness for cultural heritage are a response to the outpourings of concern coming from professional sin the early 1990s, looking for improved channels for professsional involvement.These initiatives strengthen existing frameworks for preparedness, response and recovery, and put in place a number of useful mechanisms for practical assistance at site level.

At the same time, these efforts have helped identify some of the key obstacles to achieving desired improvements. Many of these barriers are attitudinal in nature, rooted in perceptions prevalent among professionals dealing with heritage and, to a lesser extent, those in the disaster-preparedness field. Considerable 'passive' resistance can be found in the conservation community, which while always moved to respond in the moment of emergency, appears less interested in planning for preparedness than in pursuing involvement in the field's perceived current 'central' themes (authenticity, conservation of modern buildings, conservation of cultural landscapes, etc.). The focus of the 1996-99 ICOMOS triennium - *The wise use of heritage* - offers an admirable framework for increasing the attention given to cultural heritage at risk.

All of the attitudinal obstacles encountered are worth reviewing in some detail, in order to identify possible arguments for challenging underlying perceptions. These are looked at below under six conceptual headings.

### 1. Reluctance to give serious attention to the loss of cultural heritage during catastrophes that claim human life

**Argument:**
Heritage professionals invited to carry out conservation work often encounter at first hand the resentment of citizens who question the relevance of concern for material objects or elements while they deal with the emotional distress accompanying the unexpected and tragic loss of human life.

**Counter argument:**
Unquestionably, those whose lives have been disrupted by tragic human loss deserve support and respect; the ability of affected individuals and communities to regain equilibrium in their lives should be understood however to depend very much on efforts to retrieve and strengthen those heritage elements.

**Counter argument (cont.)**
and symbols that have traditionally given meaning, order and continuity to life. It is counter-productive to open dialogues which appear to offer choices between human life and human heritage.

**2. Need to strengthen collaborative working habits of built-heritage conservation professionals**

**Argument:**
Conservation professionals have a tendency to work within the perceived boundaries of their discipline, even though activities in other fields may be highly relevant to the success of their actions. Their arguments have to do with maintaining their professional purity, and with the mistaken belief that getting too close to fields like economics, tourism or disaster response will somehow dilute or compromise the heritage with which they are involved.

**Counter argument:**
An exclusive focus on conservation for its own sake is a handicap for the heritage field's efforts to work with those in other fields; where heritage advocates stand alone in uncompromising pursuit of their objectives and their practices, they risk being left out of key decision making processes and losing support for their own work. Heritage professionals appreciate that the essence of the 'integrated conservation' approaches embraced by the field 20 years ago is inclusivity, i.e., solutions which embrace all legitimate interests in a property. Conservation goals and practices thus become more attainable, accessible and 'saleable.'
Effective conservation demands full collaboration with those from other fields; working exclusively in a cultura-heritage-at-risk framework demands full and open collaboration with emergency-response officials.

**3. Need to strengthen the visible profile of risk-preparedness in the professional activities of those who work in built-heritage conservation**

**Argument:**
Many conservation professionals feel That disaster-preparedness, while worthwhile, is an essential concern only in a small number of exceptional cases.

**Counter argument:**
This view is mistaken. The consequences of one isolated event may be fatally catastrophic for the property and its inhabitants; equally, adequate preparedness for that single event requires daily vigilance.

**4. Need for built-heritage conservation professionals to strengthen their collaboration with those involved in conservation of objects, collections museums and archaeological sites**

**Argument:**
Historically, built-heritage conserva- Tion professionals have not always shown strong interest in learning from the approaches of object- or archaeological-conservation professionals, other than in technical areas such as materials conservation. This view has been based on the perception that built-heritage professionals work in essentially a different world - in a more complex daily environment, concerned much with questions of use and per- Formance as with physical conservation issues.

**Counter argument:**
Over the last forty years, those concerned with the conservation of objects, collections and archaeological sites have advanced well beyond the built-heritage field in preparing for disasters, and have significant practical experiences to impart; in addition, the preventive orientation of object conservators offers significant learning opportunities for heritage professionals interested in introducing a more holistic approach into their work.

**5. Need to strengthen interest of built-heritage conservation professionals in the value of preventive approaches**

**Argument:**
Many built-heritage professionals are more customed to planning for intervention than for prevention. Interventions are visible and dramatic, and permit explicit exploration of various Conservation philosophies; approaches focused on maintaining the existing state of the resource rarely carry the same professional appeal or interest.

**Counter argument:**
Preventive approaches extend the life of cultural heritage at a smaller long-term cost; authenticity is maintained at higher levels if periodic restoration or refashioning episodes can be avoided.

### 6. Need to strengthen interest among risk-preparedness officials in cultural heritage

| **Argument:** | **Counter argument**: |
|---|---|
| Risk-preparedness professionals occasionally profess little interest in bringing heritage into their work; this is often more a matter of a lack of knowledge of the heritage field and its needs - or belief that its practitioners are not interested in meaningful dialogue - rather than a resistance to the concept. | Disaster-preparedness professionals have generally shown themselves more than ready to integrate concern for cultural heritage if the heritage community is prepared to be explicit and clear in describing their objectives and needs, and if they can show themselves ready to be flexible in marrying their objectives to concern for life, property and the environment. |

## 2.2 A CULTURAL-HERITAGE-AT-RISK FRAMEWORK

Improving risk-preparedness for cultural heritage offers many benefits. It is important that site managers use arguments concerning such benefits, thus enhancing their ability to improve the care given to the heritage resources in their care. Aspects worth stressing are that:

- The extension of the life of cultural heritage properties, their collections and constituent elements confers a tangible benefit upon these properties;
- adoption of a cultural-heritage-at-risk framework refocuses conservation attention from the curative to the preventive, from the short-term to the long-term, and consequently offers property owners significant opportunities to realize long-term savings;
- a cultural-heritage-at-risk approach may also be seen to offer particular benefits to specific groups. Thus:
  - for the heritage professional, disaster-preparedness becomes one extreme, set along a continuum of linked concerns, rather than a special-case scenario;
  - for the heritage movement, a continuous-care framework suggests a holistic focus on management of all cultural resources rather than on a defence of what many perceive as elitist values;
  - for built-heritage professionals, there is the opportunity to work closely with object- and archaeological-conservation professionals in establishing common approaches and philosophies;
  - for risk-preparedness professionals, a continuous-care framework highlights that the heritage community shares common concerns for

> continued life, security and the various ways that that life is expressed through heritage.

Cultural heritage is always at risk. It is at risk from the depredations of war. It is at risk in the face of nature's occasional eruptions and irruptions. It is at risk from political and economic pressures. It is at risk from the daily forces of slow decay, attrition and neglect. It is even at risk from the hand of the over-zealous conservator!

If the cultural heritage community begins its dialogue based on this premise, then it will be able to make bridges not only to those responsible for planning for disasters, but also to ordinary people whose own vigilance must be stimulated, whose own courage in the face of disaster must be supported. We will be able to deal with catastrophe and its consequences without having to set human life against the worth of cultural heritage; we will recognize that the life and heritage are inextricably linked, part of one indivisible whole, and that efforts to secure one should serve to strengthen the other.

Chapter 3

# PRINCIPLES OF RISK-PREPAREDNESS FOR CULTURAL HERITAGE

## 3.1 INTRODUCTION

The heritage conservation field places great importance on the use of principles in guiding practitioners to appropriate interventions for heritage properties. Conservation professionals recognize these principles as being contained within the family of doctrinal texts loosely linked to the Charter of Venice (1964), for which ICOMOS is generally recognized as custodian. ICOMOS has taken responsibility, primarily through the efforts of its specialized international Scientific Committees, for extending the basic general principles presented in the Venice Charter by elaborating complementary texts in related fields.

ICOMOS has developed charters and guidelines in the areas of cultural tourism, underwater archaeology, historic towns, archaeological heritage management, historic gardens, recording and documentation, training and education, and - in the context of the World Heritage Convention - authenticity. This represents the first attempt since the writing of the Venice Charter to draft a set of universal principles. The principles are embodied in the Nara Document on Authenticity, which was first adopted in November 1994; it focused on the need to interpret authenticity within specific cultural and heritage, (i.e., typological) contexts.) Currently, doctrinal texts are now being developed for conservation of vernacular architecture, structural systems, and wood.

While the Kobe-Tokyo Declaration (see Appendix B), calls for development of a set of principles for cultural heritage at risk, these are not yet in place. Nevertheless, the existing 1COMOS doctrinal texts provide some guidance in treating questions relevant to improving risk-preparedness for cultural heritage. Though few articles focus directly on risk-preparedness, some references to related issues may be found, including to the importance of maintenance and to the value of recording as a form of 'insurance,' (meant to retain valuable information in the undesirable event of loss of the heritage); both are important components of a cultural-heritage-at-risk framework.

Principles appropriate in improving risk-preparedness for cultural heritage acknowledge the most important ideas to emerge from the recent Blue Shield discussions:

- Given recent international Declarations promoting the integration of improved risk-preparedness for cultural heritage in existing disaster-

preparedness infrastructures, principles should be placed within the context of existing structures and practices to protect life and property in the face of disaster or armed conflict; and

- as noted in the Introduction to this Manual, built-heritage conservation principles have been developed primarily to guide thinking about *intervention,* i.e., about curative approaches to heritage. Principles relevant to improving risk-preparedness for built cultural heritage need to be devised for *preventive* approaches, concerned with improving the general conditions for the long term survival of cultural heritage and its significant messages.

## 3.2 PRINCIPLES

Salient principles are given in the box. These are the desirable characteristics of approaches for the better management of the heritage attributes of particular properties. Each principle and its implications in risk planning, response and recovery is considered below.

- The key to effective protection of cultural heritage at risk is advance planning and preparation.
- Advance planning for cultural heritage properties should be conceived in terms of the whole property, and provide integrated concern for its buildings, structures, and their associated contents and landscapes.
- Advance planning for the protection of cultural heritage against disasters should integrate relevant heritage considerations within a property's overall disaster prevention strategy.
- Preparedness requirements should be met in heritage buildings by means which will have least impact on heritage values.
- Heritage properties, their significant attributes and the disaster-response history of the property should be clearly documented as a basis for appropriate disaster planning, response and recovery.
- Maintenance programmes for historic properties should integrate a cultural-heritage-at-risk perspective.
- Property occupants and users should be directly involved in development of emergency-response plans.
- Securing heritage features should be a high priority during emergencies.
- Following a disaster, every effort should be made to ensure the retention and repair of structures or features that have suffered damage or loss.
- Conservation principles should be integrated where appropriate in all phases of disaster planning, response and recovery.

***1. The key to effective protection of cultural heritage at risk is advance planning and preparation.***

- The best means to protect cultural heritage at risk is to ensure that adequate attention in advance planning is given to identification of heritage attributes, the risk to these attributes and appropriate response measures for these risks.

***2. Advance planning for cultural heritage properties should be conceived in terms of the whole property, and provide integrated concern for its buildings, structures, and their associated contents and landscapes.***

- No distinction should be made in planning between a property's movable and immovable cultural heritage components; there should be one integrated response plan for the property rather than one for its structures, another for its collections and a third for its landscape.

***3. Advance planning for the protection of cultural heritage against disasters should integrate relevant heritage considerations within a property's overall disaster-prevention strategy.***

- A property's disaster-prevention strategy should fully integrate concern for the cultural heritage within it, both in terms of the planning process used to develop and update the strategy, and the particular response plans which might result; there should be one fully integrated response plan for a property.
- Property managers must be able to work with inhabitants, administrators and planners to resolve conflicts and to develop conservation strategies appropriate to local needs, abilities and resources.

***4. Preparedness requirements should be met in heritage buildings by means which will have least impact on heritage values.***

- Requirements to contain risks and hazards should **not** be reduced in order to maintain heritage character; to heritage purists, a sprinkler system might be offensive in a historic structure, but its effective use can save lives, property and heritage.
- The key concerns from a heritage perspective should be the design and installation of disaster-protection systems or mechanisms in ways which will *minimize* impact on heritage values. Hence, approaches to preparedness design that remain sensitive to heritage will generally require review of a large range of alternatives, in order to ensure that the least-impact option has been identified.

***5. Heritage properties, their significant attributes and the disaster-response history of the property should be clearly documented as a basis for appropriate disaster planning, response and recovery.***

- Analysis should make reference to cultural and use significance, and the relationship of structures or elements to their setting. This information should establish priorities for protection of a property and guide fire brigades and civil defence officials to handle sensitive areas with care in responding to emergencies. It should also provide a record which would allow the accurate recovery (if warranted) of lost or damaged elements.
- Property inventories established to protect heritage should, however,be used carefully. Property elements not listed, or 'low' in priority, should not be perceived as disposable. The heritage values of heritage properties are more than the sum of the aggregate values of component parts, and efforts should be made to ensure that disaster-response plans are focused on preserving not only 'significant' elements but the totality of the property.
- Significant attention in planning for risk-preparedness should be given to obtaining and studying documentation of the performance of a structure or property during past disasters, in order to benefit fully from lessons relevant for planning for the future. Post-disaster recording can also help clarify property losses and priority needs for stabilizing and securing the property and its constituent elements.
- The existence of a complete record of the property should not substitute for all possible efforts to protect the property from the consequences of decay or disaster, or be permitted to relax vigilance against risk.

***6. Maintenance programmes for historic properties should integrate a cultural-heritage-at-risk perspective.***

- Maintenance programmes are often conceived in terms of the daily causes of deterioration of a property, e.g., visitor and occupant use and the impact of weather conditions (temperature, humidity); this perspective should be expanded to include analysis of all possible human and natural sources of decay and loss, the degree of risk associated with each and appropriate measures to reduce or mitigate risk.

***7. Property occupants and users should be directly involved in development of emergency-response plans.***

- The first line of defence and response in urgent situations will always be property occupants and users. Their involvement in planning increases their understanding of the purpose of proposed measures and the likelihood of effective response. Their involvement also brings their first-hand knowledge and experience of the property to the process of developing a response plan.

***8. Securing heritage features should be a high priority during emergencies.***

- While efforts to preserve heritage should never compromise efforts to preserve human life in an urgent situation, nevertheless, heritage - as the tangible and intangible record of all past and current lives - deserves the utmost care in emergency response.

***9. Following a disaster, every effort should be made to ensure the retention and repair of structures or features that have suffered damage or loss***.

- The involvement of qualified conservation professionals, experienced in post-disaster assessments, is critical to retention of damaged buildings and elements. For lay observers, visible damage often appears to be of greater concern than its actual condition warrants, and there is a tendency to believe recovery is either impossible, or too expensive. Condition assessments **must** come from heritage professionals experienced in looking at similar situations. It is important that the response plan for the property identifies in advance individuals capable of being called upon rapidly for such assessments.
- Assessment by a qualified specialist should result in recommended measures for immediate and urgent stabilization and protection of cultural heritage. Budget provisions for such stabilization should be part of advance planning for improving property disaster-preparedness.
- Relevant building codes and standards should be applied flexibly in post-disaster assessments. In the interests of public security, the officials responsible often quickly condemn damaged properties, citing relevant standards and codes. Without compromising public safety, heritage properties should be given the benefit of the doubt until assessment by qualified and experienced professionals can determine the true condition of the site, remedial measures required and their urgency.

***10. Conservation principles should be integrated where appropriate in all phases of disaster planning, response and recovery***.

- Conservation principles should be used to guide property documentation before, during and after emergencies: documentation should be *secure* (i.e., stored in several locations), *reliable* (i.e., its accuracy should have been verified independently of those carrying out the initial recording) and *readily accessible.*
- Conservation principles should be included among the legal and normative instruments applied in actions needed for damaged heritage elements, in order to ensure integrated response to post-disaster needs.
- As with all facets of risk-preparedness, property managers and emergency-response officials should ensure that conservation principles are an integral part of the overall set of principles applied in risk planning, response and

recovery. The decisions made should be balanced judgements based on shared principles, accepting responsibility for safeguarding the heritage resource.

- Appropriate expertise should be sought. Managers should recognize when advice must be sought from specialists, such as for wall paintings, sculpture and objects of artistic and historical value, or particular building materials and systems. The experts involved should work as part of multidisciplinary teams.

Chapter 4

# DEVELOPING A SOUND APPROACH TO RISK-PREPAREDNESS FOR CULTURAL HERITAGE PROPERTY

## 4.1 PLANNING FRAMEWORK FOR RISK-PREPAREDNESS

Developing a sound approach to risk-preparedness for cultural heritage requires a planning framework for examining particular aspects of risk-preparedness in a consistent fashion.

The essential phases of that planning framework - Preparedness, Response, Recovery - are described below.

### PREPAREDNESS PHASE

Efforts to improve preparedness for cultural heritage can include those focused on the hazards themselves and the reduction of related risk; the reinforcement of the property itself to increase its resistance to risks offered; the use of detection and early warning systems; and improving the ability of both property occupants and users and emergency-response professionals to respond in urgent situations.

#### *(1) Reducing risks at source*

This involves efforts to eliminate hazards or to reduce vulnerability of a property to particular hazards, or both. In essence, measures here are aimed at improving the ambient conditions within which the cultural heritage sits. Examples would include elimination of fire sources in a property, or reduction of hazardous activities.

#### *(2) Reinforcing the ability of a property to resist or contain the consequences of disaster*

This includes efforts to strengthen and reinforce a structure and its component parts; examples would be the use of a sprinkler system for fire, or structural reinforcement to counter the forces imparted by an earthquake.

#### (3) *Providing adequate warning of impending disaster*

Efforts here involve the use of sensors to record or predict the onset or likelihood of disaster. Examples include smoke detectors (to warn of fire), or networks of earthquake sensors intended to give advance indication of seismic activity. Risk mapping can also be part of preparedness measures to reduce the impact of disaster.

### *(4) Developing emergency-response plans*

This should bring together occupants and emergency-response officials in developing an emergency-response plan for a property; the plan should be based on shared understanding of a property, its qualities, its condition, and its needs in disaster situations, as well as preparing on-site individuals for assuming appropriate responsibility before, during and after disaster. Preparatory activities in support of the response plan would include occupant fire drills and property documentation establishing priorities for salvage or other actions during disaster.

The result should be competent disaster-response authorities and brigades having adequate awareness of the nature of a property's heritage qualities, and of appropriate means to limit damage to these qualities during response, without compromising human life or safety. Activities promoting these objectives would include awareness courses for fire officials, on-site disaster simulations, and ensuring heritage-sensitive emergency vehicle access routes across properties.

## RESPONSE PHASE

Generally, response is a function of the adequacy of preparedness measures, including appropriate response plans and training for occupants and emergency-response personnel. Many actions taken during 'response' could also be understood as part of the early phases of recovery.

### *(5) Ensuring availability of the response plan*

The response plan should have been prepared well in advance. It is important to ensure that all may have ready and immediate access to it in the event of an emergency. It is also important that the response plan be familiar and comfortable for all involved; ongoing rehearsals and simulations are important to ensure readiness for use of the plan in the event of an emergency.

### *(6) Mobilizing the Conservation Team*

A list of qualified and available conservation professionals should already have been prepared. Mechanisms should be in place to mobilize one or more members of a conservation team immediately following onset of the disaster, as needed.

## RECOVERY PHASE

Again, the effectiveness of recovery measures is in large part a function of measures planned and implemented in advance of the disaster. The quality of mitigation activities, focused on reconstruction, for example, depend on the quality of documentation prepared for the building before loss. The framework should include concern for mitigation, for rebuilding and for reinstatement of enhanced preparedness measures.

### *(7) Efforts to mitigate the negative consequences of the disaster*

Efforts here focus on means by which the full negative impact of a disaster can be reduced or compensated for. Examples include exhaustive recording prior to demolition of unsecurable elements, efforts to stabilize structure and contents following a disaster, efforts to remove or undo negative consequences (e.g., to remove flood waters and debris), and provision of temporary housing to accommodate those who might have lost homes.

### *(8) Efforts to rebuild the physical components of the property and the social structure of those using the property and its community*

Activities should focus on the physical reconstruction of buildings, neighbourhoods and infrastructure, as well as efforts to rebuild a sense of stability, well-being and purpose in the minds of those affected by the disaster. Examples here would include the reconstruction of a fire-damaged structure, or the use of personal counselling to support the victims of loss.

### *(9) Efforts to reinstate and enhance preparedness measures*

This involves assessment of the adequacy of preparedness measures in place before the disaster, and the implementation of preparedness measures enhanced to reflect the lessons learnt. Monitoring programmes to evaluate risk-preparedness effectiveness are important in achieving such improvements.

The effectiveness of the various elements of this planning framework may be examined at local (site), municipal, regional and national levels.

Factors present at the local (site) level are evidently of the highest importance; nevertheless, policies, mechanisms and initiatives operating at the other levels may have a positive or negative impact on risk-preparedness and hence merit close attention.

The following chart provides an indicative matrix for an appropriate risk preparedness strategy for cultural heritage properties to be developed within this framework, in relation to various hazards.

| Response level | Local (site) | Municipal | Regional | National |
|---|---|---|---|---|
| **Preparedness** | | | | |
| 1. Reduce risk | | | | |
| 2. Strengthen resistance | | | | |
| 3. Advance warning | | | | |
| 4. Response plan developed | | | | |
| **Response** | | | | |
| 5. Response plan available | | | | |
| 6. Conservation team | | | | |
| **Recovery** | | | | |
| 7. Mitigation | | | | |
| 8. Rebuilding | | | | |
| 9. Preparedness re-instatement and enhancement | | | | |

## 4.2 RISK-PREPAREDNESS FOR DIFFERENT FORMS OF CULTURAL HERITAGE

In the next chapters this Manual focuses on necessary preparatory, response and recovery measures for particular hazards. While its recommendations are provided for heritage properties in general, these are formulated for the most part in terms of single structures or buildings. Where significant differences exist for historic urban ensembles, archaeological sites or cultural landscapes, these are noted.

Meanwhile, this section attempts to define both the common elements to be taken into account in planning appropriate risk-preparedness measures for different types of heritage and also their essential distinguishing characteristics.

The World Heritage Convention offers a definition of cultural heritage useful for distinguishing among various forms of cultural heritage:

- *monuments:* architectural works, works of monumental sculpture and painting, elements of structures of an archaeological nature, inscriptions, cave

dwellings and combinations of features, which are of outstanding value fromthe point of view of history, art or science;

- *groups of buildings:* groups of separate or connected buildings which, because of their architecture, their homogeneity or their place in the landscape, are of outstanding universal value from the point of view of history, art or science;
- *sites:* works of man or the combined works of nature and of man, and areas including archaeological sites which are of outstanding universal value from the historical, aesthetic, ethnological or anthropological points of view.

The categories of *buildings, groups of buildings* and *sites* can be understood to roughly correspond to the categories examined below, namely *monuments* (single structures, buildings or complexes), *historic settlements,* and *cultural landscapes.* This Manual also separates out archaeological sites (a special case of monument) as deserving particular attention.

The particular planning concerns held in common in seeking to improve risk-preparedness for cultural heritage are noted below first, followed in turn by particular planning concerns applicable to monuments, archaeological sites, historic settlements and cultural landscapes.

### 4.2.1 Cultural Heritage

***Disaster Planning***

Effective disaster planning for cultural heritage should be characterized by the following:

- *Emphasize preparation, and be positive in tone and content.*
- *Use a phased approach to planning: develop the plan, test the plan, adjust and re-test until satisfactory, and confirm the plan.*
- *Raise awareness and appreciation of the values of cultural heritage among community members and the officials involved.*
- *Adopt only the highest principles of good conservation practice.*
- *Develop in the community a good understanding of significant hazards and the related vulnerability of cultural heritage.*
- *Balance risks against heritage values when determining acceptable levels of risk and in defining priorities for response.*
- *Try out plans, including through regular use of simulations and drills involving all those who might be affected; test scenarios should be realistic and reflect known patterns of disaster response in populations, e.g., during disasters, urban and rural populations tend to have different*

*Responses- the former cluster, the latter flee - and similar responses are probably predictable in relation to specific sites.*

- *Anticipate, be aware of and update appropriate line-of-command relationships, among, for example, Ministries of Culture, of Defence, of Planning and of Transport (to form an Emergency Council at national level, for instance), and between local, regional and national contexts, since these are often unclear and therefore difficult to establish during a disaster.*

- *Establish a single point of authority, and links between that focal point and different sources of aid that may be needed in emergency situations (e.g., technical services, civil security, social support for the community).*

- *Give priority to investing in people, awakening their understanding of values, needs and possibilities; do not just plan for structures.*

- *Take care to develop policies and approaches that attempt to maintain a balance between heritage, lives and livelihood in planning response and recovery.*

- *Provide risk-preparedness professionals with a clear picture of the nature of heritage goals in tangible terms (e.g., maintaining material authentic-ity).*

- *Use mechanisms that are realistic and focus on achievable objectives.*

International support is also important, but rarely at the moment of disaster; international links are best used to develop and improve longer-term approaches and measures, through comparative studies of risk-preparedness tools and mechanisms (e.g., recording, monitoring, risk assessment, etc.) elsewhere.

***Emergency-Response Planning***

- *Emergency response plans must be location specific, based on the particular physical and cultural circumstances of the heritage being cared for.*

- *An important part of building an emergency response plan for cultural heritage is that of integrating community support: improving social and cultural awareness, and community vigilance and security. Structuring and planning community support requires considerable finesse in building sustained social support for initiatives.*

### 4.2.2 Monuments

- *While having a single identifiable ownership offers some advantages in the care of monuments — providing a centre of expertise and a focus for operations — it is still important to ensure that the planning process places*

*management of risk-preparedness measures for a monument in its larger geographical and political contexts, and ensures adequate links to national and regional support networks and mechanisms.*

- ❑ *Disaster planning for monuments should integrate understanding of and respect for, their particular heritage values, and the various elements and patterns which carry these values.*

- ❑ *Special concerns for monuments include the need to focus attention on the interest and capacities of private owners (who do not necessarily share the resources or experiences of public-sector owners), the need to deal with single sites managed in partnership (horizontal integration), and the need to ensure that proposed measures link all the individuals and entities involved with monuments, from top to bottom, from maintenance staff to directors (vertical integration).*

- ❑ *Planning for monuments should make reference to the principles contained in relevant conservation charters and doctrinal texts, including the 1964 Charter of Venice and the many subsequent ICOMOS national and scientific texts, ICOM Guidelines and documents of other international and regional organizations, e.g., the Council of Europe..*

### 4.2.3 Archaeological Sites

- Archaeological sites may best be understood to be in their present condition as the result of past disasters or neglect, and so their care should be seen in a long-term perspective.

  - ❑ *Planning should concern itself particularly with site security (potential for vandalism and arson, potential for looting and illicit removal of heritage objects or fragments, safety of visitors and residents).*

  - ❑ *Planning should be guided by respect for the heritage values of a site and its various constituent elements in ways which can guide response during times of disaster. For example, analysis should distinguish between documentary values and presentation values; it should clarify existing site integrity and it should focus on remedial action in appropriate ways to maintain desired integrity and authenticity.*

  - ❑ *Planning should focus on establishing acceptable levels of risk for particular threats, in specific conditions (e.g., the stability of ruins, prevalent climatic conditions, the impact of fire, water or other agents on the particular materials of the resources (clay, masonry, wood, etc.), vulnerability to flooding, etc.).*

  - ❑ *Planning should focus on preventive aspects, including public education; in some cases where human settlements exist within archaeological sites,*

*such as Ayutthya (Thailand), the possibility for 'neighbourhood watch' involvement exists.*

- *Planning for archaeological sites should make reference to the principles contained in applicable conservation documents, including the UNESCO Recommendations for Archaeological Sites (New Delhi, 1956, but currently under revision); the 1972 Council of Europe Convention on the Protection of the Archaeological Heritage; and the ICOMOS Charter for Archaeological Heritage Management (Lausanne, 1990).*

### 4.2.4 Historic Settlements

- *Management planning must address overlapping responsibilities and potential competition to avoid conflict in response situations; it should be recognized that the tension between development and conservation which characterizes every-day planning in historic settlements is also present in disaster recovery, and that the development community, without guidance, can easily exploit disasters; the best way to avoid needless conflicts with those entrusted with recovery is to establish clear recovery guidelines before the event, trying to anticipate the dilemmas that might accompany a disaster.*

- *Disaster planning in historic settlements should acknowledge the heritage values of the settlement and the particular elements, traditions and uses through which these values are manifest.*

- *Disaster planning in historic settlements needs to reflect different economic and legal contexts (market economy, transition economy, centrally planned economy) and particular ownership and responsibility patterns, traditions and mechanisms.*

- *In working closely with individual owners, it is important to recognize that individual owners may not initially share heritage values important to a community; efforts should be made to avoid expert vs owner conflicts.*

- *Planning efforts should involve all potential actors with a stake in a community, including tourism companies, the media, insurance companies, etc.*

- *Disaster planning for historic settlements should take into account the direction given by appropriate conservation charters and doctrinal texts, including the ICOMOS Charter on Historic Towns (Washington, 1978).*

### 4.2.5 Cultural Landscapes

- *Effective risk-preparedness for cultural landscapes involves collaborative strategies that bring together private land owners; government*

*agencies responsible at municipal, regional and state levels; business leaders; and others. In all likelihood, effective risk-preparedness among so many partners will require creation of a strong coordinating mechanism: perhaps a coordinating committee or commission with a mandate to develop and support implementation of an effective response plan.*

- *Effective planning requires efforts to strengthen appreciation of the particular values of cultural landscapes among residents and users of the landscape, and also among officials responsible for risk-preparedness.*

- *Effective planning should define in tangible ways the particular attributes and practices important in sustaining the values of the cultural landscape so that these may be respected and maintained as much as possible in planning response and recovery.*

- *Effective planning should make reference to accepted conservation principles and practices in the cultural landscape field, including the results of UNESCO's Expert Meetings on the subject and the commentaries and definitions presented in Paragraph 24 of the Operational Guidelines.*

The next chapters indicate how to take the ideas discussed above and transform them into concrete action in a systematic and comprehensive manner.

The various chapters each address a major hazard, considering the implications posed by that particular hazard when working toward improving risk-preparedness for properties of cultural heritage value. Each of the chapters - on fire, earthquakes, flooding, armed conflict, and other hazards - looks at the impact of these hazards on the cultural heritage property, at the elements of appropriate risk-preparedness strategies (based on the framework for analysis and planning offered in Section 4.1), and at various technical and planning issues. Finally, Chapter 10 guides the reader through the process of developing risk-preparedness guidelines for the properties for which they hold management responsibility.

## CASE STUDY: Emergency Response and Salvage Wheel

The Emergency Response and Salvage Wheel was developed by the National Task Force on Emergency Response, set up in the United States by the Federal Emergency Management Agency (FEMA) in collaboration with the Getty Conservation Institute and the National Institute for the Conservation of Cultural Property (NIC). The Task Force brings together 25 government agencies, national service organizations and NGOS whose members are committed to providing coordinated expert assistance to cultural institutions and the public in times of disaster.

The Emergency Response and Salvage Wheel was designed by the Task Force's working group on Information for Cultural Institutions, to assist cultural institutions and agencies in the first 48 hours following an emergency. The wheel is essentially a two-sided rotating chart which allows readers to gain critical response information in two key areas. One side of the chart leads readers through a sequence of nine basic emergency-response steps, from safety precautions through to salvage priorities. The other side of the chart identifies salvage techniques and responses appropriate for particular types of collections or objects. Advice provided focuses primarily on means of controlling and mitigating water and moisture damage, perhaps the most important source of damage to collections.

The wheel, whose use has been endorsed by all of the major American institutions involved with cultural heritage preservation, has been sent free of charge to 45 000 museums, libraries, archives and historical societies within the USA. The wheel was conceived to be of particular use to small- and medium-sized institutions, which often lack the resources to maintain full-time professional conservation advisers or to develop complete emergency-response conservation plans.

The FEMA task force is also involved in development and dissemination of a host of related information products: technical leaflets, videos, radio sound bites, training packages, etc., all for use in times of emergency response.

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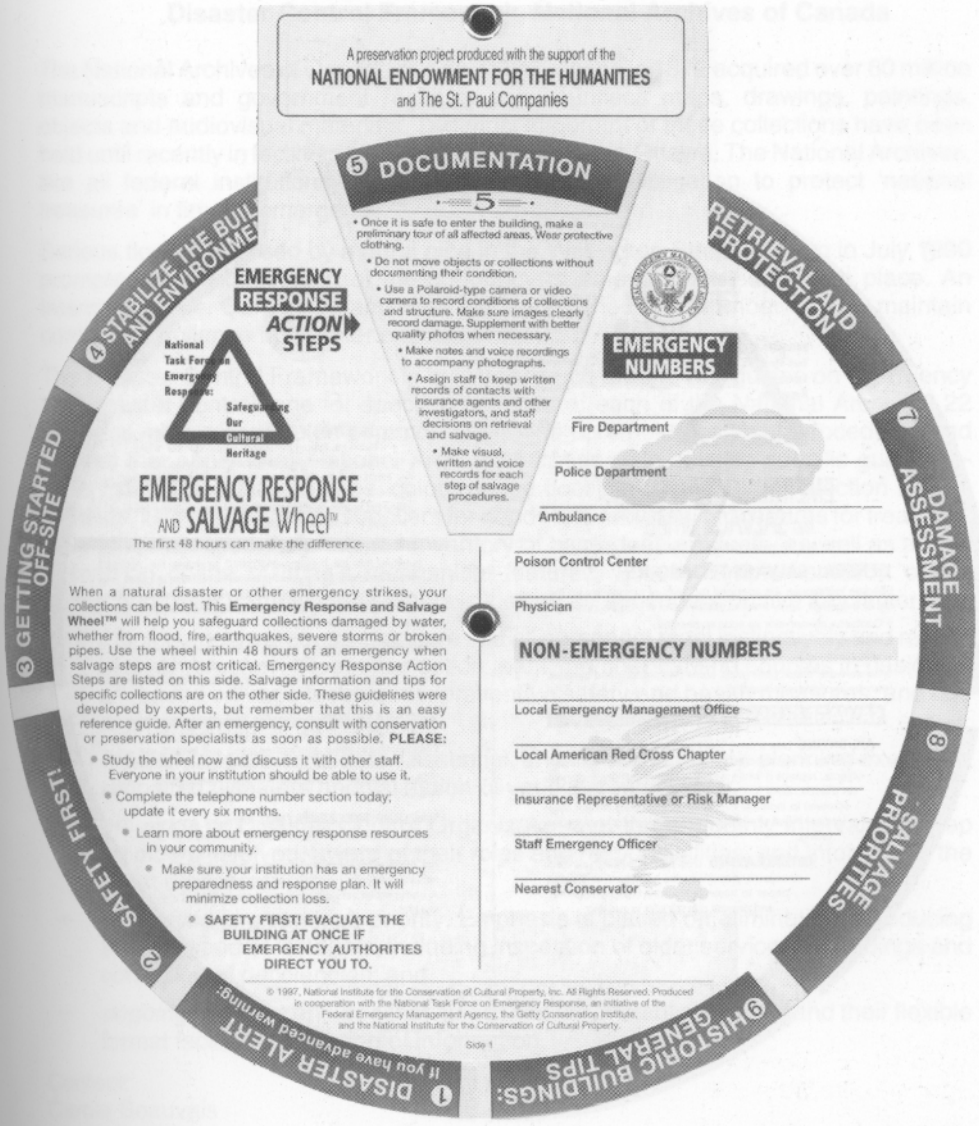
NIC Internet: http://www.nic/org




*The front side of the wheel covers emergency response action steps and provides space for key contact numbers. The nine steps include: 1. Disaster alert (if you have advanced warning; 2. Safety first; 3. Getting started off-site; 4. Stabilize the building and environment; 5. Documentation; 6. Retrieval and protection; 7. Damage assessment; 8. Salvage priorities; and 9. Heritage buildings: general tips.*


*The back side of the wheel gives advice on general salvage techniques as well as emergency salvage steps for different types of collections: furniture; ceramics, stone and metal; organic materials; natural history specimens; framed artworks; photographs; books and paper; electronic records; and textiles.*

**CASE STUDY:**
**Disaster Control Framework, National Archives of Canada**

The National Archives of Canada has since its creation in 1872 acquired over 60 million manuscripts and government records, and countless maps, drawings, paintings, objects and audiovisual materials. The most important of these collections have been held until recently in facilities at 395 Wellington Street in Ottawa. The National Archives, like all federal institutions in Canada, has a legal obligation to protect 'national treasures' in time of emergency.

Serious flooding caused by a burst pipe in the Wellington Street building in July 1990 prompted a re-examination of the adequacy of emergency measures in place. An Internal Disaster Control Organization was established in November 1993 to maintain continuing vigilance in disaster planning.

The Disaster Control Framework is built very much around two guides on emergency and disaster control: one for specific response at each of the National Archives' 22 buildings, plus a core guide common to all. The core guide contains procedures and policies that apply to all National Archives facilities. The building-specific guide provides lists of resource persons, colour-coded floor plans indicating collection rescue priorities, lists of emergency suppliers for goods and services, procedures for treatment of various damaged materials, an inventory of hazardous products, as well as a brief description of the building's mechanical features. Effective implementation of the guides and other framework elements is viewed as dependent on five key factors:

- *training and awareness* to ensure that all personnel react instinctively and rapidly in an emergency. 'Response action team' members attend courses in basic and advanced salvage techniques, preventive safety and health measures, and use of emergency equipment;
- *regular drills* are considered essential, and involve table-top planning exercises, simulated disasters and validation of various contact lists;
- *meetings* of Disaster Control Organizations at three-monthly intervals to keep members involved, aware of their roles and responsibilities, and informed of the latest developments;
- *prevention* is given high priority. Emphasis is placed on eliminating or reducing the likelihood of incidents, including inspection of older services in buildings and correction of deficiencies; and
- *ongoing updating* ensures that guides are in constant evolution, and their flexible format facilitates updating of information.

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**CASE STUDY: Evacuation Plan, Amerongen Castle, Netherlands**

In 1990, the Dutch authorities asked the curator of Amerongen Castle (one of the great houses of the Netherlands) to prepare a scheme for evacuating the contents in case of emergency. Flooding experienced in December 1993 and in January/February 1995 sharpened the focus of the plan being prepared, as did research in the United Kingdom into the fires at Hampton Court (1986) and Uppark House (1989).

The evacuation plan built for Amerongen Castle is highly pragmatic and includes numerous practical recommendations. These include the use of visible large-scale flip-chart sheets with suggested emergency response steps, development of a detailed plan of attack in full collaboration with the local fire brigade (including provisions of instructions concerning parking, water supply, and also continuous training), a commitment to a slow, meticulous - almost archaeological - clean-up as opposed to a rapid restoration of order (which inevitably results in much loss of salvageable material) and a phased evacuation priority plan (what to remove if you have 5 minutes, if you have 15 minutes, if you have 30 minutes, etc.).

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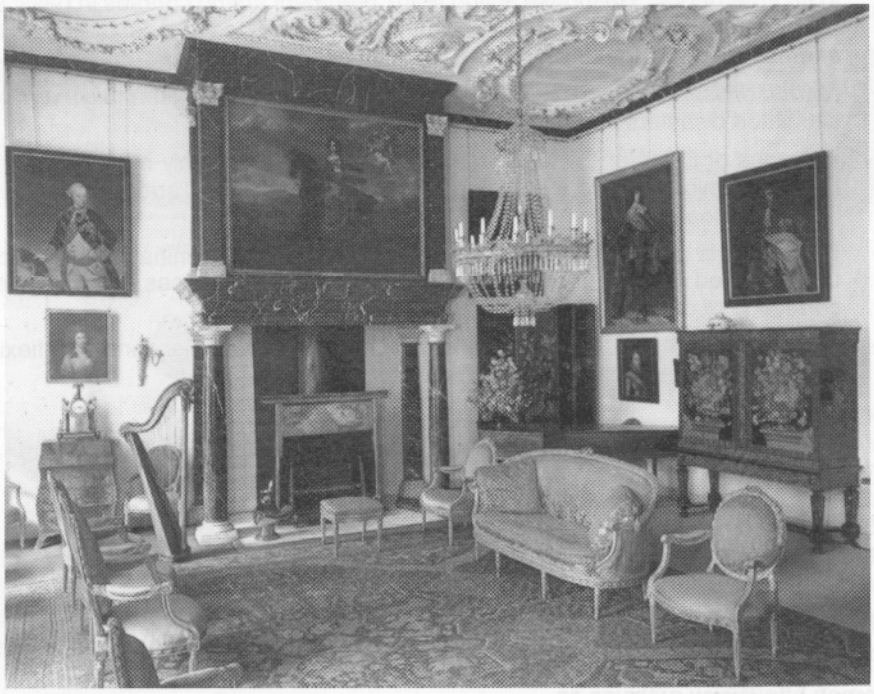
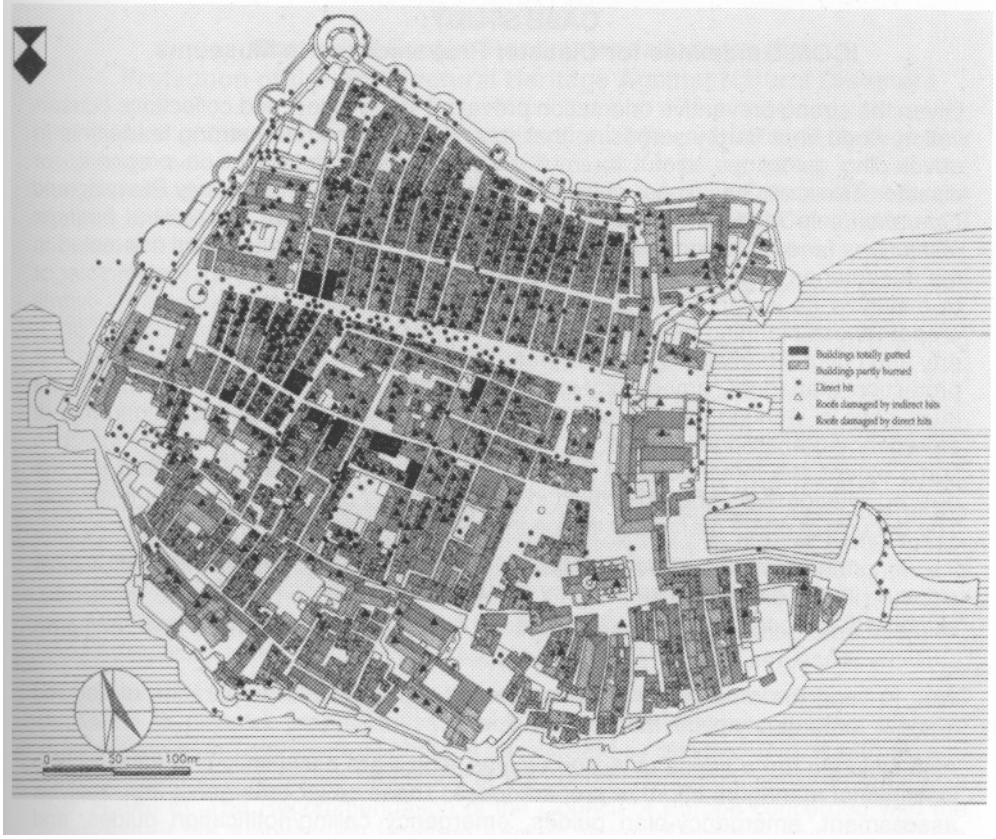


*A responsible evacuation plan has to assign priorities to all objects in a room, for removal within available rescue time periods. It is not enough – as has been learned at Amerongen Castle – to leave decisions to the local fire brigade. They are likely to start with the biggest objects, irrespective of their heritage value.*




**CASE STUDY: Dubrovnik:**
**Cultural properties damaged by shelling**

One of the tangible benefits of the involvement of UNESCO in the aftermath of the December 1991 and March 1992 shellings of Dubrovnik was the production of a publication which documented the damage to cultural property, and provided a rough estimate of costs for reparations. Production of the publication (see Bibliography for details) involved the Institute for the Protection of Cultural Monuments and Natural Environment of Dubrovnik, the Institute for the Protection of the Cultural Heritage of the Republic of Croatia, the members of the Expert Advisory Commission for the Rehabilitation of Dubrovnik, and the National Commission of UNESCO. This volume materially aided the recovery effort in providing a tangible basis for planning repairs. One of the most compelling illustrations within it is the frontispiece: a town plan providing a survey of damage resulting from the shelling. The regular spacing of direct and indirect 'hits' reveals eloquently the deliberate dimensions of the destruction carried out.

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**CASE STUDY:**
**ICOM Guidelines for Disaster Preparedness in Museums**

Given the strong preventive orientation prevalent in the object and collections conservation world, it is hardly surprising that ICOM has demonstrated strong leadership in developing guidelines useful for museum and gallery managers in preparing for disaster. The ICOM Guidelines, which appear as Chapter 12 - *Emergency Planning and Operation* — in *Museum Security and Protection: A handbook for cultural heritage institutions* (see bibliography), are addressed to institutional managers interested in the advantages of preparedness: being able to prevent the occurrence of disaster or to minimize its impact. The *Guidelines* constitute an excellent example of overall preparedness planning for institutions, within which concern for human beings, property and cultural heritage is fully integrated. The document also defines the roles that protection managers, emergency-programme managers and institutions managers must play in working closely with each other to assure the overall coherence of emergency-preparedness plans. While in small institutions these roles may merge to some extent, the focus given to the different areas of responsibility helps clarify the desired relationships and objectives in preparedness planning within the institution. The document offers managers advice in three particular areas:

- primary emergency protection (concerned with tools and mechanisms to have in place when an emergency occurs);
- emergency threat assessment or risk analysis (concerned with long-term measures to understand and reduce risk);
- and the emergency plan (concerned with advance preparation of detailed emergency plans for the institution).

Also included are a series of *Action Guides,* which are essentially checklists to help institutional managers improve preparedness. These cover emergency-risk-analysis assessment, emergency-plan guides, emergency calling/notification guides, and emergency services and supplies. The document concludes with a set of 45 'recommendations' - essentially key principles or guidelines important in planning an effective museum protection programme. The tone of the document - quite practical and down-to-earth - derives from third person characterization of the desired behaviour of managers. Rather than commenting philosophically on the pros and cons of various approaches, the direct language use ("the emergency programme manager determines ... ") compels action and involvement in readers.

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## CASE STUDY:
## Council of Europe Recommendations on the Protection of the Architectural Heritage Against Natural Disasters

The Council of Europe first explored the protection of the architectural heritage in a colloquium held in Ravello, Italy, in 1989. An expert working group built on the conclusions emerging from that meeting to develop a text for presentation to the Council of Ministers. A final Recommendation was adopted by the Committee on 23 November 1993.

The Recommendation (No. R (93) 9) which "recommends that the governments of the member states adopt all legislative, administrative, financial, educational and other appropriate measures ... as part of their general policy for conserving the architectural heritage" is accompanied by an Appendix which provides supporting principles and measures in a number of important areas, including establishing a legal and administrative framework for disaster protection, establishing appropriate financial and insurance measures, education and training, risk assessment and disaster prevention and mitigation strategies. A number of technical appendixes are also attached to the Recommendation, dealing with disaster prevention and mitigation measures at the organizational level, with fire organizational measures and with organizational measures related to earthquakes, vulcanism, tsunami, floods, storms, avalanches and landslides or flows. The Recommendation's supporting appendixes give particular weight to the notion of 'risk analysis,' a relatively innovative approach to the domain and one subsequently much imitated in other jurisdictions.

The Council of Europe has also produced two parallel Recommendations of great relevance to disaster preparedness: the Recommendation on control of physical deterioration of the architectural heritage accelerated by pollution (No. R (88) 5), and the Recommendation on the protection of the cultural heritage against unlawful acts (No. R (96) 6). The Recommendation of the Council of Europe concerned with the Protection of the Architectural Heritage Against Natural Disasters has served as a particularly useful source in development of this manual.

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## CASE STUDY: Safeguarding Your Historic Site: Basic Preparedness and Recovery Measures for Natural Disasters

This practical how-to-prepare handbook was published with the aid of the United States' Federal Emergency Management Agency (FEMA) following disasters in the early 1990s in the New England, USA, historic districts of Nantucket, Massachusetts, and Montpelier, Vermont.

On October 30, 1 991 a powerful winter storm overwhelmed Nantucket, the first historic district to be designated under the American Register of Historic Places. A storm surge inundated Nantucket's harbourfront and town centre, and flooded the basements of many historic homes. Many shoreline cottages and homes were swept off their foundations and destroyed by the storm. The impact of the storm was intensified as it arrived with less than twenty minutes of warning.

On March 11, 1992, an ice jam on the Winooski River in downtown Montpelier, Vermont, flooded the entire downtown area, including over 100 historic buildings on the National Register of Historic Districts. Again, lacking an emergency-preparedness plan, Montpelier was poorly prepared to respond to the disaster.

Following these two disasters, local officials responsible for disaster response requested technical assistance from FEMA The handbook grew out of FEMP:S response to the request. The handbook focuses on 'hazard mitigation' - practical, down-to-earth preventive measures that can reduce the likelihood of destruction or damage from disasters. Hazard mitigation activities are examined in four areas:

- *hazard proofing* — lessening vulnerability to hazards by improving building design;
- *structural measures* — measures to ensure the safety of people and development during disasters;
- *emergency management* — planning advance preparations and recovery operations for disasters; and
- *land management* — limiting use and development in potentially hazardous areas.

The handbook leads readers through the three phases of emergency preparedness - namely *before:* risk evaluation, hazard mitigation, and emergency preparedness; *during:* protection; and *after* stabilization and recovery - and at each point identifying the steps needed, associated critical issues, and further sources of information.

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Chapter 5

# FIRE
# Developing a property-specific strategy to improve risk-preparedness for cultural heritage

## 5.1 DAMAGE TO PROPERTY

Fire causes severe damage directly and indirectly to property and cultural heritage. the main types of damage that result from fire are considered below.

### 5.1.1 Damage to buildings and their contents

- Full or partial destruction of objects and building elements by burning.
- Damage from heat, smoke and combustion by-products (soot) to structures, interior finishes and objects. Particularly at risk are organic elements such as wood, although the high temperatures associated with fire can reduce the structural capacity of non-organic materials without visible signs of deterioration.
- Water damage resulting from the effects of fire-fighting efforts to arrest the spread of fire.

### 5.1.2 Damage to historic districts

- Damage to structures and objects as in Section 5.1.1, above.
- Destruction of municipal infrastructure systems, particularly electrical and communications systems, and systems for delivering natural gas. Damage to such systems can accelerate the spread of fire.

### 5.1.3 Damage to cultural landscapes and archaeological sites

- Damage to structures and objects located within landscapes and sites as for Sections 5.1.1 and 5.1.2.
- Destruction of trees, crops and plant life.
- Destruction of insects, birds, animals and their habitat.
- Increased risk of secondary damage resulting from floods and mud slides associated with increased runoff from hills and woodlands devoid of ground cover.

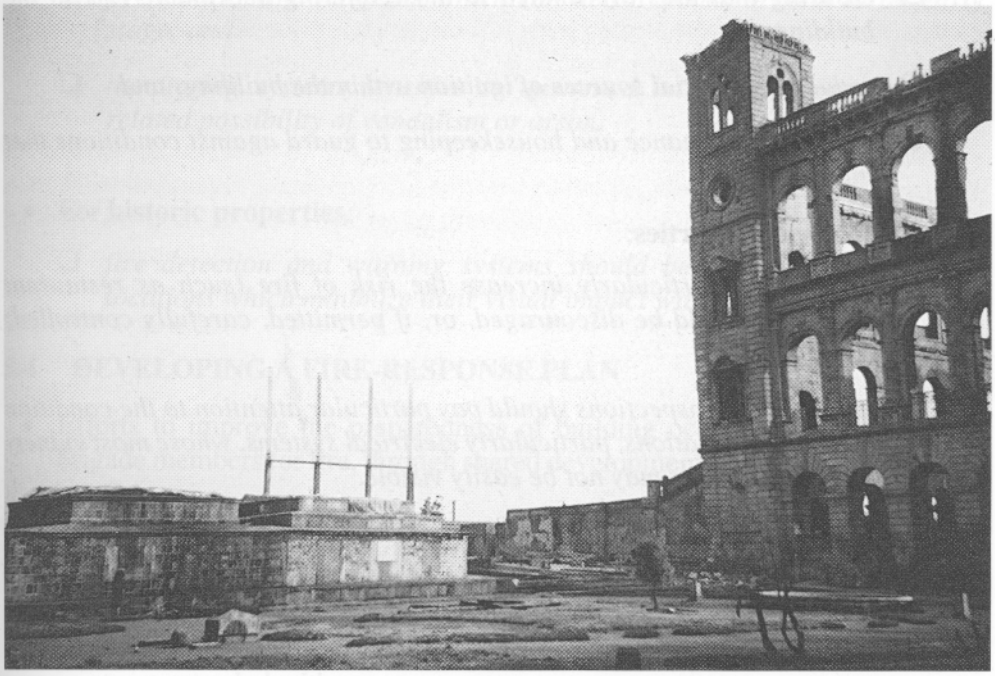
*The Rova d'Antananarivo, Madagascar. This historic hill-top complex of 9 buildings (royal palaces, tombs and temple) was built primarily in wood during the 17th to 19th centuries. The cultural and religious heart of the country, it had been proposed for inclusion on the World Heritage List. (Photo by Gaël de Guichen,ICCROM)*

## 5.2 DEVELOPING A FIRE-PREVENTION STRATEGY

A fire-prevention strategy can reduce the potential for damage to cultural heritage, as evident in the devastating fires at Hampton Court in 1986, and at Uppark (a National Trust house) in 1989, or in the example given above in 1995. It requires comprehensive efforts from both those responsible for fire prevention and those responsible for cultural heritage. They must work together in developing a balanced strategy equally capable of improving care for human life, property and heritage.

### 5.2.1 Responsibility for developing the strategy

Generally, a specific individual (possibly supported by deputies), is responsible for fire safety in a specific building or property. A Fire Prevention Officer should be designated by the Director, and this officer, who may also be responsible for security, health and general safety in the building, should initiate and oversee all aspects of the fire-prevention-strategy plan, in liaison with the fire brigade staff and with professional advisors (architects, surveyors, engineers, planners, specialists in historic buildings, etc.) and representatives from insurance companies. The strategy should be subject to constant rehearsal and review, and records of all



*The Rova d'Antananarivo, Madagascar. Fanned by high winds, a fire devastated the complex on 6 November 1995. Five of the buildings were razed to the ground; of the remainder, only basements and perilous masonry elements survived. Out of 6175 inventoried objects, 1183 were saved. (Photo by Gaël de Guichen, ICCROM)*

activities should be made. This individual should ensure that the strategy finally adopted fully integrates concern for protection of cultural heritage within it.

### 5.2.2 Elements of the strategy

Some measures for fire protection are usually in place in most buildings, given the high risk of fire in all human settlements. These measures often fail to address the full range of both passive and active measures by which protection can be improved. An effective fire prevention and mitigation strategy for properties should include measures in a full range of complementary organizational, technical and physical areas. In addition, particular objectives to be met in protecting the property's historic values should also be clarified.

Those areas to be addressed in developing a complete and effective fire-protection strategy include those considered in the following sections.

## 5.3 REDUCING RISK

- Efforts to reduce hazards, vulnerability and risk, that is, efforts to reduce the likelihood of ignition of fire should include:

- *ensuring that uses are limited to those offering acceptable risk to the building;*
- *reducing potential sources of ignition within the building; and*
- *careful maintenance and housekeeping to guard against conditions that increase risk.*

- For **historic properties**:
  - *uses which particularly increase the risk of fire (such as restaurant kitchens) should be discouraged, or, if permitted, carefully controlled; and*
  - *maintenance inspections should pay particular attention to the condition of older installations, particularly electrical systems, whose most vulner-able components may not be easily visible.*

### 5.3.1 Strengthening resistance to fire

- Efforts to strengthen the resistance of a building to the spread of fire should include:
  - *use of fire-retardant materials or fire separators in buildings to reduce the rate of spread of fire from one space to another, or from one building to another;*
  - *provision wherever possible of secure exit routes from the building;*
  - *installation of emergency response mechanisms which can be used by trained occupants, including fire extinguishers, or buckets of water or sand; and*
  - *automatic systems — including sprinklers and other fire suppression systems — triggered by smoke or heat sensors.*

- For historic properties:
  - *structural measures (including sprinkler systems and fire-delaying doors and partitions) should be designed to minimize their impact on the architectural and aesthetic values of the historic structure; and*
  - *fire extinguishers and other rapid response measures should be selected to ensure the extinguishing agent will have minimal impact on the historic structure and contents.*

### 5.3.2 Fire detection and monitoring

- Efforts to provide adequate fire monitoring systems should include:

- *fire sensors and monitors which can detect smoke or heat at an early stage; and*
  - *monitoring systems sensitive to unwanted intrusions, because of the related possibility of vandalism or arson.*

- For **historic properties:**
  - *fire detection and warning systems should be installed in ways and locations which minimize their visual impact within the structure.*

## 5.4 DEVELOPING A FIRE-RESPONSE PLAN

- Efforts to improve the preparedness of building occupants, users and fire brigade members for fire, through shared development of a fire-response plan, involving:
  - *elaboration of comprehensive fire-response plans that detail requirements for timely evacuation of people and significant objects, collections and fittings; provide specifications for property access and water supply access; and draw attention to areas within the building deserving special care; coupled with*
  - *occupant and fire brigade training, establishing roles and responsibilities in relation to implementation of the fire-response plan.*

- For **historic properties:**
  - *inventorying and mapping fragile, important and valuable building elements, finishes and objects. This should be carried out by heritage professionals, and the resulting documentation should be organized within a readily accessible and secure plan for collections removal, prepared in collaboration with the fire brigade. The plan should clearly indicate priorities for removal should choices be necessary;*
  - *the response plan should clarify responsibilities and procedures for possible removal and care of important objects during emergencies. The plan should ensure provision and use of secure storage areas for objects requiring removal;*
  - *it is important to ensure that prior training has determined which fire and smoke alleviation strategies will minimize damage to the historic structure; and*
  - *it is important to ensure the fire brigade has good knowledge of how to apply any special heritage provisions defined within the fire-response plan.*

Strong efforts to ensure continuous monitoring and upgrading of a property's fire response and mitigation strategy should be made by a building's fire safety manager.

For historic properties, it is important to ensure that the fire prevention and mitigation strategy is applied flexibly. The package of precautions should be designed to meet basic safety requirements, while minimizing harm to the character of the historic structure. All structural alterations and the installation of mechanical, electrical or other systems associated with fire prevention, detection and fighting should be limited to those absolutely necessary to ensure fire-safety requirements. Individual strategies will vary according to circumstances, but in each case the emphasis should be on prevention, preparation, vigilance, early detection and an orderly application of evacuation and fire-fighting procedures, rather than on structural alterations.

The best fire prevention and mitigation strategy for a historic building will be one that fully meets defined standards of security for people, objects and the building, with least harm to heritage values, at least cost. Budgets nevertheless should give priority to meeting the full cost of implementing the strategies identified; skimping on the strategy may produce savings in the short term, but risks much larger losses over the long term.

## 5.5 BUILDING THE STRATEGY: TECHNICAL AND PLANNING MEASURES

The following sections suggest, with comments, specific technical and planning measures which may be useful in developing the fire-prevention strategy. These may be used as a rough check list when developing such a fire-prevention strategy.

### 5.5.1 Minimizing risk

Potential sources of ignition should be identified and eliminated or their risk minimized. Ignition sources include human error and negligence, naked flames (candles, gas lighting, gas kitchen stoves, open fires), old and worn electrical equipment and circuitry, old or improvised heating installations, older or unmaintained fireplaces, cleaning chemicals and paints, etc.

Particular attention should be paid to household repair activities, such as soldering, paint removal or carpentry, which, if not managed carefully, may increase risk of ignition.

- ❑ *Keep all parts of a building clear of waste and rubbish. In particular, attics, basements, enclosed stairways and under-stair areas, cupboards, empty storerooms and workshop areas should be inspected regularly, cleared of unnecessary material and kept clean.*

- *Make sure that electrical installations, circuits and equipment are regularly tested, properly maintained, used and overhauled. Do not overload circuits; systematically replace faulty equipment and wiring. It is advisble to locate the main electrical intake, primary switches and fuse boxes in a separate, fire-proof enclosure, room or area.*

- *Discourage the use of naked flames from heat and light sources such as candles, torches, gas lighting and open fires or stoves. Where their use is permitted, there should be careful monitoring, strict control and the provision of safety screens when unattended. The provision of suitable fire-fighting equipment adjacent to the risk is advisable.*

- *Allow only trained workers to undertake maintenance, repair and improvement work on historic properties. They should be made aware of the importance of the building and its fittings, and be supervised by a senior and responsible member of staff*

- *Carefully supervise any work carried out. Hot-work (involving blow-lamps, cutting, welding, paint stripping, etc.) should only be allowed if there is no alternative. Any acceptable hot-work should be the subject of a permit which identifies and controls the responsible parties, the nature, location and duration of the work and which ensures that combustible materials are removed or protected. In addition, extinguishers and alarm systems must be provided and work supervised and monitored at all times, with provision for checks for a period after the work is completed.*

- *Install lighting conductors (arrestors or rods) that are properly designed and maintained.*

- *Sweep chimneys regularly. Maintain all hearths, flues and ducts in a sound condition. All cookers, heaters, boilers and furnaces should be serviced regularly, be kept clear of combustible materials and be provided, where appropriate, with fire and safety screens. Kitchens, heating plants and boiler or furnace rooms should always be provided with suitable fire-fighting equipment, and the rooms should not be used for storage.*

- *Ban smoking in historic buildings or confine it to specific, fire-protected rooms or areas, installed with fire-fighting and alarm equipment.*

Provisions should be made against arson, and, in particular, premises and their curtilages should be secure against unauthorized entry. Temporary staff and visitors should be checked and supervised, and flammable and waste materials kept out of reach.

### 5.5.2 Fire retardation and property protection

In some circumstances, particularly to ensure safe and adequate means of escape, physical measures to extinguish the fire and to reduce the rate of its spread may prove helpful. Such provisions might include:

- *Enclosure of staircase compartments, where feasible.*
- *Alternative means of protecting the means of escape, such as use of a positive air pressure system, to prevent smoke and flame penetration and spread.*
- *Installation of automatic smoke vents and hatches, which would also allow improved access for fire fighting purposes.*
- *Lobbies, with new partitions built around existing features.*
- *Adequate fire-resisting doors, including self-closers, fire-stops and intumescent strips attached to frames.*
- *Application of intumescent paint and other finishes to panelling or cast iron columns.*
- *Installation of automatic emergency lighting and signs independent of the normal electricity system.*
- *Construction of barriers, in particular where these will not detract from the character of the building; for example, in undivided roof spaces, and by the reinstatement of missing partitions.*
- *Use of automatic fire suppression systems where it can be demonstrated that these reduce risk. Modern fast response sprinkler systems, based on zone signalling, should be employed. Regular maintenance, focused on the identification and elimination of faults, must be undertaken. Every effort should be made to reduce the visual impact of such systems on the special interest of the historic buildings. The insertion of sprinkler systems, particularly in areas of fragile construction, containing delicate fabrics, panelling, furniture, works of art, and so on, and in unventilated areas, must be carefully undertaken. Attic and roof spaces and spires and towers may provide suitably appropriate locations for installation of holding tanks or visually intrusive components inside historic buildings.*
- *Use of dry sprinkler systems placed on facades in narrow streets in dense urban areas will assist in the control of urban fire spread.*
- *Fitting of premises with fire buckets and hand-held extinguishers which must be suitable for both general and specific risks. Extinguishers should be inspected and overhauled on a regular basis.*

The approach adopted should give preference to soft (non-intrusive) measures, pursuing the application of hard (intrusive) measures only where all other measures are demonstrably inadequate and jeopardize human life and architectural heritage.

### 5.5.3 Fire detection and warning systems

The development of adequate fire detection and warning systems should take into account the following points:

- *The most basic fire detection and alarm systems set off audible alarms within the structure, but are not monitored elsewhere. These systems depend for reliability on the 24-hour presence of trained personnel.*
- *It is preferable that automatic fire detection systems be installed and connected to an alarm report centre and to the local fire brigade. The location of each individual detector should be identifiable, and the system provided with the ability to monitor faults and false alarms. Smoke, heat and flame detectors can be installed and connected to alarm centres by hard wiring or by radio-link. The casings for the detectors should be unobtrusive, as small as possible and adapted in shape and colour so as avoid a negative impact on setting.*
- *On the exterior, heat detecting cables should be considered in some cases, such as where there is thatch or timber cladding.*
- *In all cases, detectors and alarms must be properly and regularly maintained and the relevant staff trained to understand and handle the systems.*

### 5.5.4 Development of response plans

Effective fire-response plans require the involvement of both property occupants and fire-fighting professionals in developing the plan, and in training exercises intended to ensure a plan's full implementation. Development of response plans should take the following considerations into account:

- *Development of fire-fighting capacity by staff or occupants of historic buildings should be encouraged, with the provision of regular, monitored programmes of awareness and skills building.*
- *Where possible, occupants should be involved with fire-fighting professsionals in development of the fire-response plan, to increase occupant ownership for the plan and its provisions.*
- *Training should include simulations of fire outbreaks to verify the practical adequacy of the measures in the response plan.*
- *The response plan should clearly distinguish between the roles of occupants and cultural heritage professionals and those of the fire brigade in*

*response. This division of responsibilities should have been thoroughly reviewed by the two groups and agreed to well in advance.*

- *It is important to ensure adequate access at all times for the emergency services. Roads and access points should be chosen, well identified and maintained to the greatest degree possible. In sensitive gardens and landscapes, the maintenance of green ways may suffice.*

- *Water supplies should also be identified and plotted, including all main water sources, wells, reservoirs, storage tanks and towers, ornamental canals, ponds and lakes, swimming pools and natural sources such as rivers, streams and lakes. Where no readily accessible supply is available, then consideration should be given to the establishment of such or to the provision of an emergency storage tank of adequate capacity, suitably located, hidden or disguised.*

- *Means of providing immediate access to and within the building should always be assured, for example by the insertion of roof hatches and by ensuring that doors can be unlocked and opened in emergency.*

- *Heritage documentation constituting a base for developing the response plan should include data on the following:*

  - significant landscapes features around a structure to be avoided where possible in obtaining access to the structure;

  - important character-defining attributes — including interior and exterior finishes, details, spaces and patterns — to be given special care in response; and

  - movable interior fittings, objects, furnishings, fittings, collections requiring special care (and possibly removal) during response.

Hierarchies of importance among landscape features, building attributes and a structure's movable elements should be established and constitute part of the plan, where possible, to minimize losses to important features or objects during response.

## 5.6 RESPONSE

Effective response is demonstrably a function of effective preparation. During a fire, occupants and fire-fighting professionals will not have time to improvise or create fire-response strategies. They will have to depend on the advance preparation already carried out.

To explore the adequacy of preparations for response, the following questions may be useful:

### 5.6.1 For the fire safety manager and team

- ✓ Have up-to-date response plans been prepared for the building?
- ✓ Have these been reviewed by the relevant fire officials or members of the fire brigade?
- ✓ Do the provisions of the plan satisfactorily integrate concern for the site's heritage values?
- ✓ Has the plan been effectively communicated to occupants and the fire brigade for execution?
- ✓ Have the provisions of the plan been tested and verified in training or simulation exercises?

### 5.6.2 For occupants

- ✓ Are occupants aware of their responsibilities in the event of fire?
- ✓ Do occupants have permanent access to the fire response plan?
- ✓ Are they familiar with the provisions of the plan and prepared to implement these provisions?

### 5.6.3 For local fire officials

- ✓ Have the relevant officials been involved in developing and reviewing the fire-response plan together with the site's fire safety manager?
- ✓ Are officials comfortable with those provisions identifying special attention and care to be given to heritage elements, fittings and features?
- ✓ Are members of the fire brigade aware of the provisions of the fire-response plan, and clear about their responsibilities for implementation?
- ✓ Is the fire-response plan at hand for immediate use and consultation during an emergency?

## 5.7 RECOVERY

In the early phases of recovery from a fire, a preliminary condition assessment should be undertaken in order to quickly plan for urgently needed stabilization, repair or rebuilding, and further study. Analysis should be directed to:

_ requirements for emergency shoring and propping;

- evidence concerning possible causes of the fire;
- conditions and stability of structural members and systems;

- the condition of non-structural members and finishes;
- the condition of building systems and services (e.g., electrical supply system; plumbing; heating, ventilation and air conditioning (HVAC) system);
- the condition of building foundations and adjacent soil;
- the condition of significant objects and fittings, and identification of those requiring removal or special treatment, or both;
- preventive measures required to assure protection from vandalism, theft, etc.;
- ease of repairs and availability of replacement materials;
- availability of experienced and qualified professionals and craft-speople to carry out the necessary repair and restoration;
- the availability of expert supervision for essential repair and upgrading work; and
- the need for detailed condition assessment and testing.

Following the initial condition assessment, further specific actions should be undertaken as needed. Some of these are considered below.

### 5.7.1 The structure should be stabilized

This should focus on the protection of the public, and investigation of the causes of the fire, together with subsequent recording, salvage and rescue work. Fire-fighting professionals should ensure that the fire has been effectively extinguished, and that possibilities for re-ignition have been eliminated. Professionals experienced in assessment of fire-damaged structures should be called upon to verify the carrying capacity and stability of structural systems. Efforts to minimize the possibility of further damage should also be initiated, including covering damaged roofs by temporary barriers, such as tarpaulins, to exclude water entry; and securing the property against entry of unauthorized personnel, vandalism and theft.

### 5.7.2 The negative effects of the fire and fire-fighting methods should be addressed

Charred material should be carefully sifted to recover salvageable objects or elements. Residual water should be removed by mechanical and physical methods (suction pumps, sponges, cloths, etc.) and the building should be thoroughly dried through improvement of air flow and, where possible, by the use of dehumidifiers.

### 5.7.3 Detailed condition assessment should be made of the fire-damaged structure

Where possible, non-destructive techniques should be used to look at hidden conditions; the installation of moisture monitoring equipment should be considered.

### 5.7.4 Initiate salvage recording and conservation measures for damaged objects, elements and the structure

The structure, valuable artefacts and fittings, including those dislodged, damaged or in danger of collapse, should be recorded through drawings or photographs *in situ* and then carefully removed, under the supervision of conservation specialists, for urgent conservation measures in a safe area. Where feasible, photogrammetric recording should be encouraged as a cost-effective means of recording.

### 5.7.5 Reinstate all alarm systems and fire-fighting equipment

It is very important to re-establish property security as quickly as possible after a disaster since a property is at that time most vulnerable to subsequent disasters.

### 5.7.6 Prepare repair and reconstruction plans

Further structural works, including restoration, repair or demolition, must only be undertaken after full consultation with heritage-conservation professionals expert in assessing fire damage and its consequences.

Chapter 6

# EARTHQUAKES AND RELATED DISASTERS
## Developing a property-specific strategy to improve risk-preparedness for cultural heritage

### 6.1 DAMAGE TO PROPERTY

Earthquakes can cause damage both directly and indirectly to property and cultural heritage, resulting in a variety of types of damage, some of which are noted below.

***Buildings and their contents*** are especially liable to structural collapse and damage related to lateral forces transmitted to buildings. Thus:

- walls, unreinforced vertical components (e.g., chimneys) and unsecured standing objects may topple;
- horizontal and vertical joint fasteners and connections may be severed or broken;
- building components may shift laterally and permanently relative to each other;
- building components may collapse on and crush objects and collections;
- structural cracks may appear in building elements which have absorbed lateral forces;
- building stability and resistance to future shocks may be reduced;
- freestanding items may be displaced;
- suspended items may become dislodged;
- service supply lines — water, sewerage, electricity, telephone, fuel supply lines (e.g., natural gas) — to properties may be blocked or severed, in turn increasing risk of secondary damage from fire or water;
- property alarm, early warning and communication systems may be damaged, slowing effective response;
- humidity and temperature monitoring and control systems for museums, collections, galleries may be lost; and
- access to and from properties may be impeded by collapse or damage of landscape elements such as trees and roads.

***Historic districts,*** in addition to damage to component structures and objects, may also suffer damage to their systems as noted below.

- destruction of municipal infrastructure systems, particularly electrical and communications systems, and water, gas and sewerage systems. Damage to such systems can increase the potential for collateral water and fire damage, and reduce the ability to communicate effectively in an emergency-response situation; and
- damage to transport infrastructure — roads, railways, waterways, airports — including bridges, underpasses, culverts, elevated passageways and vehicles, potentially impairing effective movement of citizens and access by emergency-response vehicles to threatened or damaged areas;

Cultural landscapes and ***archaeological sites*** may suffer the types of damage noted above for individual monuments and groups of buildings, as well as the following:

- toppling or damage to landscape features such as trees, fences or unstabilized wall fragments;
- liquefaction of soil, which can happen under certain circumstances, and lead to landslides or subsidence;
- increased risk of secondary damage from fire, or from flooding resulting from damage to hydro-electric installations or to dams;
- destruction of animal and plant life, and loss of habitat for various species, resulting in erosion of biodiversity;
- damage to transport infrastructure, impairing effective response by citizens and impeding access by emergency-response vehicles to threatened or damaged sites.

## 6.2 DEVELOPING AN EARTHQUAKE-PREPAREDNESS STRATEGY

An earthquake-preparedness strategy should include elements which both reduce the potential for damage to cultural heritage, and establish clear modalities for reaction to an emergency. It requires mutual commitment on the part of those responsible for earthquake preparedness and those responsible for cultural heritage to work together in developing a balanced strategy to improve care for human life, property and heritage.

### 6.2.1 Responsibility for developing the strategy

Unlike the provisions usually in place for fire protection, rarely do measures for earthquake protection for specific properties assign responsibility to a single officer, even in zones of high earthquake risk. Attention is most often given to earthquake-readiness concerns only when individual properties are renovated by their owners. Most contemporary building codes require that buildings being renovated meet contemporary requirements for all aspects of public safety, namely

fire, earthquake protection, etc. At that point, the building's earthquake readiness is assessed.

While municipalities in areas of high earthquake potential frequently make systematic efforts to evaluate the risk to structures, and to upgrade structures to better withstand risk, such studies do not always result in adoption of overall strategies to upgrade earthquake preparedness for individual properties.

Even though the risk of earthquake may seem less immediate than that of fire, it is important that responsibility for a property's earthquake protection be permanently assigned to an individual or team who can continuously review and upgrade earthquake-related provisions. The property earthquake officer should work closely with municipal and state officials in devising an earthquake strategy appropriate for the property, its occupants, its contents and its heritage values.

### 6.2.2 Elements of the strategy

Earthquake protection strategies will differ from those devised for fire in two major respects:

- earthquakes — unlike fire — cannot be prevented;
- the event itself — also unlike a fire — is relatively brief, and cannot be controlled.

These differences suggest the importance of focusing effective earthquake-protection strategies on preparation and on response: on measures aimed particularly at reducing risk, at enhancing earthquake resistance, at improving earthquake detection and monitoring, and at developing a response plan.

The strategy should suggest ways in which its various measures should respect heritage values, while improving earthquake protection.

In earthquake zones, some attention is likely to have been given to increasing the earthquake resistance of particular buildings. Such efforts, however, only address part of an effective property-specific, earthquake-protection strategy.

Those areas to be addressed in developing a complete and effective earthquake-protection strategy for a heritage property include:

- ***reducing risks***, which could involve efforts to reduce the impact of earthquakes on particular properties through:
  - ❑ *ensuring high levels of property maintenance;*
  - ❑ *reducing sources of ignition, to reduce likelihood and consequences of secondary fire; and*
  - ❑ *ensuring suitable property uses in high-risk zones.*

- *for historic properties in particular, maintenance should pay particular attention to the state of older electrical or fuel supply systems, to reduce the likelihood that fire may break out following an earthquake.*

- ***increasing earthquake resistance***, covering
  - *efforts to strengthen the resistance of a building or its components to earthquake damage;*
  - *risk analysis to determine the likely intensity and frequency of earthquakes;*
  - *analysis of the structure's response to previous seismic events;*
  - *reinforcement of structural systems to increase the ability of a building to meet an earthquake's lateral forces;*
  - *isolation of the building from the ground in order to interrupt or divert the lateral thrust of an earthquake.*
  - *for historic properties in particular, measures to reinforce or isolate structures should be undertaken in ways which have minimal impact on the property's heritage values.*

- ***Earthquake detection and monitoring*** through efforts to provide adequate early warning of an earthquake, and knowledge of the event's critical parameters:
  - *in-ground sensors and communications systems capable of providing advance warning of the arrival of an earthquake; and*
  - *systems for measuring the intensity and location of an earthquake and for ensuring transmission of this information to emergency-response centres.*

- ***Earthquake-response planning***, encompassing:
  - *preparation efforts by occupants and emergency-response officials in anticipation of earthquakes;*
  - *involvement of occupants and earthquake-response officials in risk analysis for particular properties and zones, and in identification of needs* to *improve earthquake protection*;
  - *ensuring that municipal and regional plans indicate properties and structures deserving special care in the event of an earthquake;*
  - *development of a comprehensive earthquake-response plan; and*
  - *earthquake-reaction training and drills for occupants and earthquake-response officials.*

- in addition, **for historic properties:**
  - *the response plan should include an inventory and full documentation of fragile and significant building elements, objects and fittings which deserve special attention (and possibly salvage removal and conservation) in the aftermath of an earthquake;*
  - *provision, on site, of an adequate supply of materials for salvage, protection, restoration, etc;*
  - *provision for removal of threatened or damaged materials to a secure storage or conservation facility;*
  - *identifying emergency teams of trained and experienced conservation professionals (architects, engineers, surveyors, planners, archaeologists,historians, etc.), craftspeople, builders and responsible members of the local community, available and able to respond during emergencies; and*
  - *earthquake-protection training should sensitize officials to the nature of heritage buildings and objects, and indicate appropriate salvage care.*

A property's earthquake-protection strategy should be the subject of continuous monitoring and review, in order to identify and introduce possible improvements.

It is important to ensure that a historic property's earthquake-protection strategy is applied flexibly. The package of measures adopted should be designed to meet basic safety and stability requirements, with least harm to the character of the historic property. Structural alterations should be the minimum necessary to enhance earthquake protection to an acceptable level.

The best earthquake protection strategy for a particular property will meet all defined standards of safety and security for people, property and objects, with least harm to heritage values, and at least cost.

## 6.3 BUILDING THE STRATEGY: PLANNING AND TECHNICAL MEASURES

This section suggests, with comments, specific planning and technical measures which may be useful in developing an earthquake-protection strategy. These may be used as rough checklists in developing a property-specific earthquake-protection strategy.

### 6.3.1 Reducing risks

Although nothing can be done to reduce the likelihood of occurrence of earthquakes, good maintenance can reduce the potential damage or loss.

- Maintenance efforts, undertaken regularly following inspections, ensure the full effectiveness of measures adopted to improve earthquake resistance.
- Maintenance repairs should make optimum use of appropriate traditional techniques and materials where these have contributed to seismic resistance.
- Regular inspection should focus on the adequacy of a number of specific elements important in earthquake resistance, including:
  - *mortars and grouting in masonry structures;*
  - *tensile resistance, bonding and strength of connections of floors and roofs to walls; and*
  - *wind and water tightness.*
- Regular inspection should always include the state of electrical and fuel systems, to limit the likelihood of secondary risk, especially fire, and associated negative consequences.

Regional planning can also reduce risk on a macro-scale in a number of ways, such as:

- *Allocating land use systematically, to ensure that the most sensitive uses (e.g., hospitals) are placed in the most stable areas.*
- *Controlling density of occupation in sensitive areas so as to reduce impact of indirect damage, particularly fire.*
- *Imposing zoning controls for electrical and fuel supply systems, in order to be able to cut off the spread of secondary fire.*

### 6.3.2 Increasing earthquake resistance

Efforts to increase earthquake resistance must be based on adequate understanding of a building, its structural systems, construction materials and techniques, its evolution, history and conservation, its condition, its heritage values and its likely earthquake performance.

All physical alterations to improve resistance must be based upon an adequate survey and must meet requirements for earthquake resistance established by local authorities. Studies to produce recommendations should take into account the seismic history of the region and of particular properties, in order to improve understanding of measures previously taken. Such an analysis requires looking closely at:

- *The existing resistance of historic structures and materials to earthquakes.*

*Builders have devised a variety of Ingenious means to minimize human injury and structural damage from earthquakes. An excellent example is the construction technology developed in Chilca, Peru, in an area of high seismic risk. Instead of massive, traditional masonry constructions, they built wooden frameworks which were then covered with wattle-and-daub and plastered with lime mortar. While resembling ordinary masonry, these structures respond to earthquakes by losing their coating in a relatively harmless shower of dust, leaving the basic framework intact. (Photo by Alejandro Alva, ICCROM)*

- *The effectiveness of traditional concepts and methods of improving resistance.*
- *The variable behaviour of different structures and materials — timber-frame, rubble or ashlar masonry, earth structures, etc. — in the face of seismic activity.*
- *The implications for behaviour in the event of a disaster of building defects, both intrinsic and extrinsic.*
- *Evaluation of the effectiveness of previous modern strengthening practices and techniques.*
- *Assessment of different levels of earthquake intensity, and of past and expected frequency of occurrence.*
- *Experiences from previous seismic events in the area or of such events in comparable circumstances elsewhere.*

Design criteria and reinforcement recommendations sensitive to the values of historic properties should ensure that:

- *The works proposed will not result in the loss or impairment of the special interest or integrity of the historic property.*
- *Preference is given to respecting, retaining and enhancing existing structural systems and materials where possible; in other words, the emphasis is on performance-based analysis. This means recognizing the adequacy of the performance of existing structural systems and members as a means of evaluating the overall effectiveness of structural systems (rather than relying exclusively on the numerical computations, or ability of constitu-ent members or assemblies to meet code requirements).*
- *Preference is given to use of traditional materials and techniques in reinforcement.*
- *Where new materials and reinforcement techniques are proposed, these are compatible with those already existing, and are durable and reversible, as far as is practicable; if these conditions cannot be met, alternative proposals should be commissioned and evaluated.*
- *Each building and any proposed works are assessed on their own merits.*
- *Earthquake-reinforcement analysis is based on building performance, rather than on simple application of code requirements, with due consideration given to improvements offered by technical developments.*
- *Proposed works are designed against realistic probability assessments of disaster occurrence, intensity, and associated risk levels.*

The opportunity to upgrade earthquake resistance should always be pursued when a building is the subject of a major programme of repair, alteration or extension. Existing inappropriate or unauthorized forms of construction, extensions or alterations should be removed where possible.

All improvements and strengthening work should be fully documented, allowing for long-term review with the aim of contributing to establishing appropriate international standards.

### 6.3.3 Earthquake early warning and detection systems

Development of effective earthquake early warning and detection systems involves extensive documentation — both historical and current — in several important areas.

- Precise data should be collected and collated on the probability of occurrence of earthquakes within the geographic region, including type, location, probable intensity and likely frequency. This must be undertaken not only based

on present-day and long-term scientific research and monitoring of future causes and events, but also on the basis of an analysis of the documentation available on past disasters. Information should be published in map form, with data maintained in digital format.

- Geological, hydrological, meteorological and related natural processes and factors should be monitored. This would include water courses and levels, soil characteristics and subsurface geology, whose behaviour and interaction in the event of disaster could have an impact on property, lives and cultural heritage.
- General seismic, meteorological, hydrological and geological data relevant to assessing the vulnerability of property in general (and cultural heritage specifically) to hazard and probable damage or loss should be systematically collected and analysed.

Analysis of the above conditions will improve the ability to provide accurate early warning of the intensity and frequency of earthquakes. Such analysis should also contribute to general preparedness planning for earthquakes, including efforts to:

- *minimize vulnerability by developing and implementing measures for assistance (technical and financial) for the strengthening, repair and maintenance of cultural property;*
- *control use of historic properties and related alterations where risk is high and alterations might increase risk; and*
- *control proposed alterations to the use of land in the vicinity (local and regional) of significant cultural property, where that land practice demonstrably increases risk.*

### 6.3.4 Development of a response plan

Preparation of an effective response plan for emergency action in the event of an earthquake will require the full involvement and collaboration of both property occupants and earthquake-response professionals, and will have to take into account a number of factors.

- *The response plan should include provisions for training occupants and staff, civil defence officials and all other public authorities in recording, salvage and emergency repair, shoring, propping and emergency protection methods and practice, and in the implementation of security measures to counter theft, arson and other criminal activity.*
- *Training activities should be accompanied by the publication of technical advice, and survey and record data.*
- *Training should involve earthquake-response drills and simulation to verify the adequacy of provisions in the response plan.*

- ❑ *The response plan should clearly distinguish between the roles of occupants or staff and the roles of earthquake emergency professionals. This division of responsibilities should have been thoroughly reviewed by the two groups and agreed to well in advance.*
- ❑ *The response plan should include adequate documentation concerning the heritage values of properties, including:*

– significant landscape features and spaces around a structure to be avoided where possible in obtaining access to the house, and deserving special care in response;

– important building attributes to be given special care in response, including interior and exterior finishes, details, spaces and patterns; and

– important movable interior elements requiring special care (and possibly removal) during response, including fittings, objects, furnishings and collections.

- ❑ *The response plan should also include provision for a storage and salvation conservation facility, to which damaged items could quickly be removed. To ensure immediate care, the availability of trained and experienced conservation professionals should have been established as part of the response planning.*

## 6.4 RESPONSE

As with fire, the effectiveness of earthquake response depends very much on the adequacy of advance planning. Unlike fire, and given the brevity of seismic events, response will occur only after the seismic event is over, but while remaining aware of the danger of aftershocks. Hence, for earthquakes, the response phase is essentially a part of recovery.

To explore the adequacy of preparations for response, the following questions may be useful:

- **For property managers and relevant occupants and staff:**
  - ✓ Have up-to-date earthquake-response plans been prepared for the site?
  - ✓ Have these response plans been reviewed by the relevant emergency-response officials?
  - ✓ Do the provisions of the plan satisfactorily integrate concern for the building's heritage values?
  - ✓ Has the plan been effectively communicated to occupants and emergency-response officials responsible for its implementation?

- ✓ Have means of liaison (designated individuals or alternates; communication channels) during emergency been established?
- ✓ Have the provisions of the plan been tested and verified in training or simulation exercises?

- **For occupants**:
  - ✓ Are occupants aware of their responsibilities in the event of an earthquake?
  - ✓ Do occupants have permanent access to the earthquake-response plan?
  - ✓ Are the occupants familiar with the provisions of the plan, and prepared to implement those provisions?

- **For local emergency-response officials:**
  - ✓ Have the officials responsible developed and reviewed the earthquake-response plan in collaboration with property managers?
  - ✓ Are officials comfortable with those provisions identifying special attention and care to be given to heritage elements, fittings and features?
  - ✓ Are members of the emergency-response team aware of the provisions of the earthquake-response plan, and clear about their responsibilities for implementation?
  - ✓ Is the earthquake-response plan at hand for immediate use and consultation during an emergency?

## 6.5 RECOVERY

In the early phases of recovery, attention should be paid to the likelihood of continuing seismic aftershocks. While these may be less severe than the initial seismic event, they may exacerbate post-disaster conditions and interfere with recovery plans.

After an earthquake, particular attention should be given to immediate condition assessment in order to quickly plan for urgently needed stabilization, repair or rebuilding and further study. Following immediate documentation of damaged elements (using recording equipment — still cameras, videos, lights, batteries — prepared and maintained for the purpose), analysis should be directed to:

- ❑ *the condition of significant objects and fittings, and identification of those needing removal for conservation;*
- ❑ *needs for emergency shoring and propping;*
- ❑ *the condition and stability of structural members;*
- ❑ *the condition of building systems and services;*

- *the condition of foundations (type, vulnerability, intrinsic safety, differential settlement);*
- *ease of repair and availability of replacement materials;*
- *availability of experienced and qualified professionals and craftspeople to carry out the repair and restoration needed; and*
- *the availability of expert supervision for essential repair and upgrading required to meet current building life, safety and health standards.*

Initial condition assessment should be the basis for the following actions:

Structures should be stabilized in order to protect the public, to prevent further damage, to permit salvage operations for important objects or collections and to permit detailed assessment of building condition. Professionals experienced in earthquake assessment should be called upon to verify the carrying capacity and stability of structural systems. Efforts to minimize the likelihood of further damage should also be initiated: damaged walls and structural elements should be shored and openings properly secured against vandalism, entry by unauthorized persons, and theft.

- Negative impacts of the earthquake should be addressed. Rubble and debris should be carefully shifted to ensure recovery of damaged objects or finishes. Recovery efforts should be accompanied by ongoing recording of conditions.
- Detailed condition assessment should be carried out. Where possible, non-destructive techniques should be used to look at hidden conditions.
- Salvage recording and conservation measures for damaged elements and the structure should be initiated. The structure, valuable artefacts and fittings, including those dislodged, damaged or in danger of collapse, should be recorded through drawings and photographs *in situ.* Any movable items should then be carefully removed under the supervision of conservation specialists and moved to a safe area for urgent conservation if necessary. Recording should continuously accompany efforts to shift debris and clean up the site.
- Security and fire alarm systems and on-site fire-fighting equipment should be installed and activated. It is very important to re-establish property security as quickly as possible after a disaster, since a property is then most vulnerable to subsequent disaster.
- Plans for repair or reconstruction of damaged structures should be prepared. Further structural works of any kind — including repair, reconstruction or demolition — should only be undertaken after full consultation with heritage conservation professionals with expertise in assessing earthquake damage and its consequences.

## CASE STUDY:
## The National Trust's Emergency Procedures at Historic Houses

The National Trust for Places of Historic Interest or Natural Beauty (in England) developed an in-house guide in the 1980s to assist managers of National Trust properties to ensure adequate emergency procedures. Initially developed by a working party of staff from a variety of professional disciplines within the Trust, the document also profited from detailed review in 1992, following the disastrous fire at Uppark. The Emergency Procedures guide has been conceived as a 'working' document intended to guide staff in improving preparedness, while integrating lessons and experiences gained overtime. While many organizations eschew long detailed procedural manuals of this type — fearing they will not be read at the moment of emergency — the Trust suggests the critical importance of staff gaining advance familiarity with all the material in the document of relevance to their individual roles. The document is based on a core of instructions for Emergency Procedures at Historic Buildings, which includes sections of policy, emergency-planning responsibilities, emergency-support team measures, immediate emergency response by emergency type, roles (property, regional office, head office), staff responsibilities, communication lines and relationships, and salvage measures. This core is supported by a number of detailed annexes, including guidelines for establishing emergency plans at National Trust buildings, training of emergency-support teams, guidelines for rescue and protection in emergencies (specific to the materials, objects and conditions in which they are found), dealing with the press and media, general precautions for floods, and detailed descriptions of staff responsibilities for 24 different positions within property management hierarchies. As with the approach offered in icon's *Guidelines for Disaster Preparedness,* the National Trust's document constitutes an integrated approach to risk preparedness, one in which concern for the welfare of cultural heritage is placed within a larger framework of parallel concerns for life, property and the environment.

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**CASE STUDY: The Risk Map of Cultural Heritage**
**Istituto Centrale per il Restauro, Italy.**

An innovative approach to improving risk-management for cultural heritage has been taken by Italy's Central Restoration Institute (ICR). The initiative, originally developed by the Institute's Dr Pio Baldi, is aimed at predicting preventive measures required most urgently, in relation to the environmental conditions in which Italian cultural heritage is situated, and time/cost effectiveness of available preventive measures. Recognizing both the importance of the Italian cultural heritage and the limited funds available for its conservation, the project seeks to improve the ability of Italian authorities to focus their spending on preparedness measures most likely to benefit the heritage.

The project is being developed in several phases. The first phase involves gathering data concerning the environmental risks to which cultural heritage may be subject, in order to draw up thematic maps for various risk environments (earthquakes, volcanoes, floods, air pollution, etc.) and human factors (theft, vandalism, tourist pressures, etc.). Information gathered from municipal databases concerning the distribution of cultural heritage is integrated to identify areas most exposed to risk factors.

The second phase involves, first, detailed cataloguing of various cultural heritage objects and expressions and their vulnerability, and, second, detailed analysis of particular related conditions: stone deterioration, environmental pollution and climate control. The purpose of this phase is to verify, over time, the actual nature and rate of decay process in the environment, to improve the predictive accuracy of the risk mapping carried out.

A final phase of analysis will involve generation of a computer-based synthesis of the distribution and vulnerability of recognized items of cultural heritage value, and their associated risk factors, all portrayed in map form. Pilot projects carried out in Rome, Naples, Ravenna and Turin are being implemented to test methodologies and the associated software/hardware systems.

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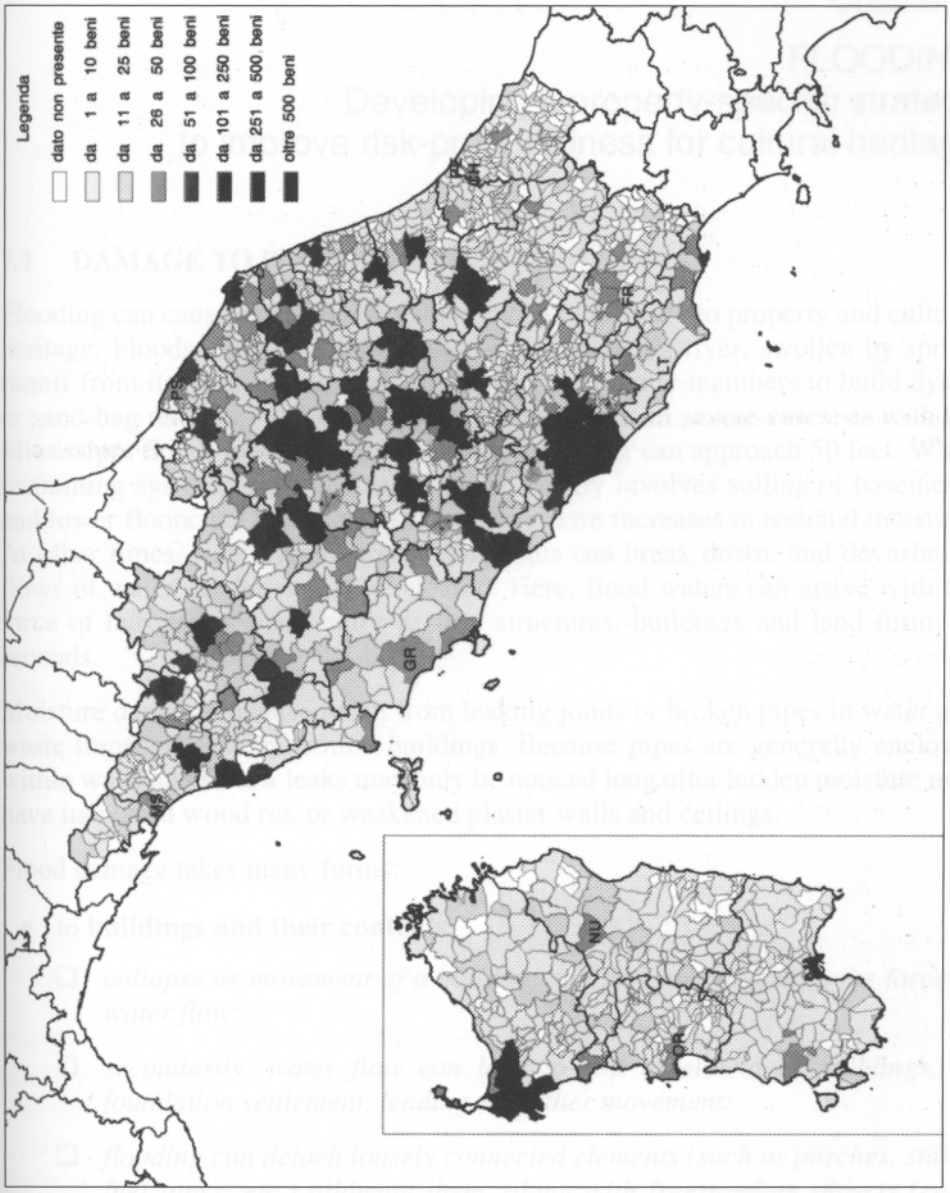



*Map of components and distribution of cultural heritage. Central Italy. Sources: Italian Touring Club Guides of Italy and Laterza archaeological guides.*
*The map shows the quantity of architectural and archaeological monuments in each municipality of Central Italy according the bibliographical sources cited above.*
*(Photo courtesy of Istituto Centrale per il Restauro)*

Chapter 7

# FLOODING
## Developing a property-specific strategy to improve risk-preparedness for cultural heritage

### 7.1 DAMAGE TO PROPERTY

Flooding can cause severe damage directly and indirectly to property and cultural heritage. Floods come in many forms. A slowly rising river, swollen by spring runoff from its tributary streams, challenges community members to build dykes or sand-bag retaining walls to hold off rising waters. In severe cases, as with the Mississippi floods of summer 1993, the rise of water can approach 50 feet. When restraining systems are broached, damage usually involves soiling of basements and lower floors and their contents, and long-term increases in residual moisture. At other times, river system controls or dams can break down, and devastating flows of water can be suddenly released. Here, flood waters can arrive with the force of hurricanes, and utterly destroy structures, buildings and land forms in seconds.

Moisture damage can also result from leaking joints or broken pipes in water and waste transport systems within buildings. Because pipes are generally enclosed within walls and floors, leaks may only be noticed long after hidden moisture may have increased wood rot, or weakened plaster walls and ceilings.

Flood damage takes many forms:

- to **buildings and their contents:**
  - *collapse or movement of a building and its elements due to the force of water flow;*
  - *secondarily, water flow can lead to soil erosion near buildings, or foundation settlement, leading to further movement;*
  - *flooding can detach loosely connected elements (such as porches, stairs, fuel tanks, etc.) allowing them, along with freestanding objects (cars, house objects, etc.), to enter flood waters. The resulting debris acts as projectiles or abrasive agents, causing damage to structures;*
  - *building services sited in basement areas, such as fuel tanks, furnaces, electrical supply entries and control panels, etc., can be inundated, thus rendering the services inoperable and inaccessible;*

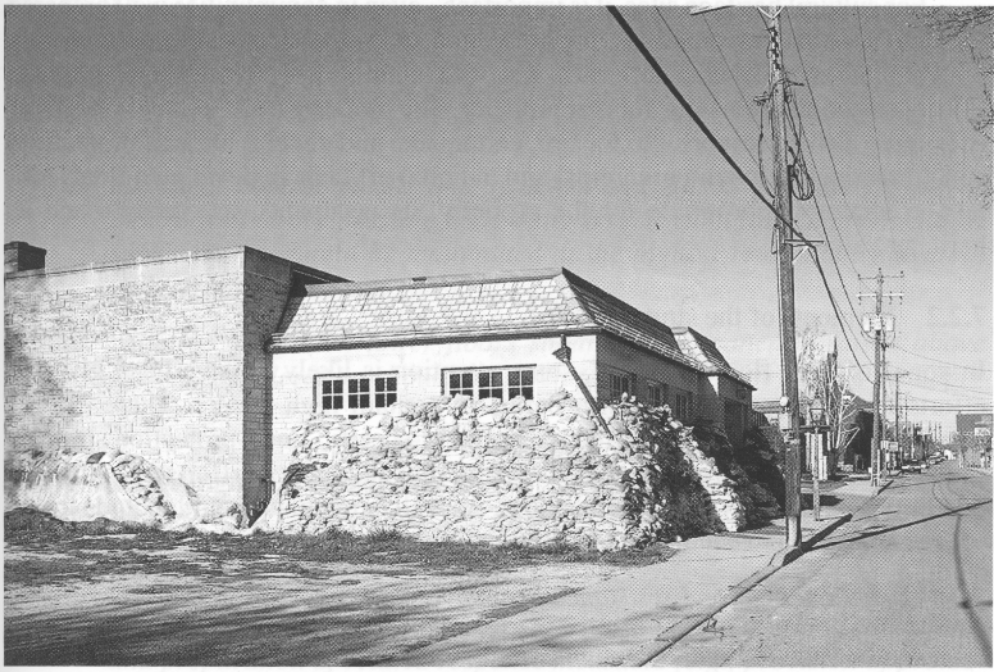
- *flooding can cause mixture of water and sewerage systems; water can become polluted, sewage can enter building spaces, and health problems result; and*
- *water and humidity can cause particular damage to objects, fittings, furnishings, collections, libraries and archival records; damage can include loss, separation or removal from original setting or context; rusting and corrosion of metals; dissolution of finishes, paints and surfaces; erosion of masonry mortars and deposition of waterborne impurities in the pores of masonry units; warping, splitting and cracking of wood and organic materials, and increased susceptibility to rot; deposition or contamination from waterborne chemicals and micro-organisms.*

- to **historic districts:**
  - *damage to constituent structures and objects, as for buildings and their contents described above;*
  - *full or partial destruction of municipal services, including electricity, domestic gas, drinking water, sewerage and communication systems; and*
  - *loss or damage to municipal transport infrastructure, such as roads and bridges; such losses can impair effective movement of response vehicles to damaged sites.*

- to **cultural landscapes and archaeological sites,** in addition to the problems listed above:
  - *loss or potential destruction of landscape elements and defining features of landscape patterns, such as trees, fields, road and park systems, walls, floors, etc.;*
  - *alteration of landscape functioning, through movement of road beds and shorelines, deposits of silt and mud, shifting of water tables, etc; and*
  - *deposition of flood debris, such as tree trunks, material from towns and villages (vehicles, house structures and objects), etc.*

## 7.2 DEVELOPING A FLOOD-PREPAREDNESS STRATEGY

A flood-preparedness strategy can reduce the potential for damage to cultural heritage. It requires well-integrated efforts on the part of both those responsible for flood control and for emergency response, and those responsible for cultural heritage. Together, they have to develop a balanced strategy to improve care for human life, property and heritage.



*Floods cause various types and degrees of damage. Slowly rising floods, such as the Mississippi flood of spring 1993, deposit layers of mud within unprotected buildings; normal conditions return only after months of drying out. Cataclysmic floods such as the Saguenay (Quebec) flood of July 1996, can wrest entire structures from their foundations and irreversibly alter the path of watercourses. (Photo of sand-bagged building in Ste Genevieve, Missouri, by Meryl Oliver)*

### 7.2.1 Responsibility for developing the strategy

As flooding — unlike earthquakes — is a hazard whose frequency is fairly predictable, and whose consequences can be mitigated by planning, communities potentially at risk often maintain an office bearing responsibility for flood protection. Nevertheless, as is evident from recent calamities in Holland, along the Mississippi River in the USA and the Oder River in Poland and Germany, extreme situations can easily overcome well-prepared sites and communities. As the Saguenay floods in Quebec show, cataclysmic flooding can also easily overwhelm well-prepared emergency staffs and plans.

Attention within municipalities is usually directed to flood prevention and protection on a community-wide scale rather than to measures to protect individual buildings. Building-specific measures may be undertaken during renovation as contemporary building codes generally require that buildings be upgraded to meet current standards for all aspects of public safety: fire, earthquake protection and, frequently in vulnerable areas, flood protection.

For cultural heritage sites, it is important — even in communities well prepared for floods — that responsibility for protection of particular sites be permanently assigned to an individual or team who can continuously review and upgrade flood-protection provisions for that property. The property flood-protection officer (who may also be responsible for fire, earthquake and general hazards protection) should work closely with municipal and national officials in devising a flood-protection strategy appropriate for the property, its occupants, its contents and its heritage values.

### 7.2.2 Elements of the strategy

In zones of high flood potential, some attention is likely to have been given to efforts to prepare dykes or earth berms to contain high waters. These efforts, however, are only part of an effective property-specific flood-protection strategy. Flood-protection strategies should give particular emphasis to efforts to control the conditions which may generate flooding. As well, strategies should include measures useful in:

- *enhancing flood resistance for individual properties,*
- *improving flood detection and monitoring, and*
- *developing appropriate local response plans.*

The strategy should suggest ways in which its various measures will respect heritage values, while improving flood protection.

Those areas to be addressed in developing a complete and effective flood-protection strategy for a heritage property include reducing risk, increasing resistance to flood, enhancing flood early warning and detection, and flood-response planning. These areas are looked at in more detail below.

### 7.2.3 Reducing risks

- For **individual properties,** efforts to reduce the impact of floods on communities and their constituent properties should pay particular attention to:

- *maintenance of roofs, gutter and drainage systems;*
- *ensuring, to the extent possible, that sensitive property uses (i.e., those offering high prospect of loss to property, life or heritage) are located outside high-risk zones;*
- *community-wide strengthening of protective dykes or earth berms; and*
- *water management measures on a regional basis to control water flows in particular catchments.*

- For **historic properties:**
  - ❑ *flood preparation for individual buildings requires regular maintenance to high standards, to ensure buildings are always at their best to resist flood;*
  - ❑ *electrical control panels and switches and HVAC controls should be placed well above possible high-water levels; vulnerable components of such systems should be maintained at the highest reasonable elevation within a structure; and*
  - ❑ *valuable objects on lower floors should be permanently raised above floors; consideration should be given to keeping such objects on upper floors.*

### 7.2.4 Increasing flood resistance

- Efforts here should focus on strengthening the resistance of a building and its components to flood damage, including:
  - ❑ *analysis of the ability of a structure to withstand extreme flood conditions, and preparation of related response measures (e.g., provision of protetive closures for openings; identifying sources of materials for property dykes) to reduce the chance of water entry;*
  - ❑ *reinforcement of structural systems to increase the ability of a building to withstand flood forces, such as strengthening of building-to-foundation and foundation-to-ground connections.*
- For **historic properties,** *measures to reinforce structures, to strengthen connections and to protect exposed openings should be undertaken in ways which have minimal impact on a property's heritage values.*

### 7.2.5 Flood detection and monitoring

Activities should include:

- ❑ *efforts to provide adequate early warning of the expected occurrence and likely intensity of a flood;*
- ❑ *establishing monitoring stations along river systems; setting up small-scale automated meteorological stations monitoring precipitation levels; and ensuring use of integrated analysis and communications systems capable of providing advance warning of the arrival and intensity of expected floods; and*

- *secure, damage-resistant systems for measuring the intensity and location of flooding and for ensuring transmission of this information to emergency-response centres.*

### 7.2.6 Flood-response planning

- This will involve efforts to assist occupants and emergency-response officials to prepare for floods, through:
  - *involvement of occupants and flood-response officials in risk analysis for particular properties and zones, and in identification of flood protection needs; municipal and regional plans should indicate properties and structures deserving special care in the event of flooding;*
  - *development of a comprehensive flood-response plan; and*
  - *flood-response training and drills for occupants and emergency-response officials.*
- For **historic properties,** the response plan should include:
  - *an inventory and documentation of fragile and significant building elements, objects and fittings which may require special attention (and possibly salvage removal and conservation) prior to, and in the aftermath of flooding;*
  - *provision, on site, of an adequate supply of materials for salvage, protection, restoration, etc;*
  - *provision for establishing secure centres for emergency storage of re-located objects, and conservation treatment of waterlogged materials (including refrigeration facilities);*
  - *provision for ensuring that emergency teams of trained and experienced conservation professionals (architects, engineers, surveyors, planners, archaeologists, historians, etc.), craftspeople and builders, and responsible members of the local community are available for assessment, stabilization and planning repair interventions during emergency-response operations; and*
  - *provision for flood-protection training which sensitizes officials to the nature of heritage buildings and objects, and appropriate salvage care.*

A property's flood-protection strategy should be the subject of continuous monitoring and review, in order to identify possible improvements.

It is important to ensure that a historic property's flood-protection strategy is applied flexibly. The package of measures adopted should be designed to meet basic safety and stability requirements, with least harm to the character of the

historic property. Structural alterations to a property should be the minimum necessary to ensure adequate flood protection.

The best flood-protection strategy for a particular property will meet all defined standards of safety and security for people, property and objects, with least harm to heritage values, at least cost.

## 7.3 BUILDING THE STRATEGY: PLANNING AND TECHNICAL MEASURES

This section suggests, with comments, specific planning and technical measures which might be useful in developing a flood-protection strategy. This material could be used as a rough check-list when developing a property-specific flood-protection strategy.

### 7.3.1 Reducing risks

Efforts to reduce risk of flooding can play a significant role in a flood-protection strategy. These should be based on a thorough assessment of numerous factors, including:

- *duration and probable frequency of flooding, not only on the basis of past events but also in view of changes in land use;*
- *systematic mapping of vulnerability, i.e., areas which would be covered by flood torrents and flooding of varying intensities;*
- *effects of climactic changes on maximum short-term precipitation and floods;*
- *infiltration (soil, subsoil and geology, seasonal factors, vegetation and sealed areas) and changes likely to affect infiltration (cropping, defores tation, removal of topsoil, traffic);*
- *topography of site (distance to watershed, slopes, elevation, probability of ponding);*
- *effects of water and rain on cultural heritage properties, especially watertightness of buildings and potential for direct damage to elements, together with assessment of secondary impacts, such as effects of in creased humidity;*
- *effects of flooding on foundations and lower floors, on structural members (walls and floors), on non-structural elements and on fixtures and fittings; and*
- *assessment of possibilities for improved drainage from an area.*

Based on these assessments, measures to improve protection for communities and their component properties could include:

- *building protective dykes, levees and drainage channels;*
- *ensuring the availability of cofferdams, sandbags and pumping and dehumidification equipment;*
- *planning for controlled removal of important artefacts to predetermined secure storage sites;*
- *control of land use to avoid abusive exploitation and siting of vulnerable uses in sensitive zones;*
- *gutter verification and plumbing maintenance;*
- *provision for important objects and fittings to be permanently raised above floor level (at least 20 cm) to avoid damage during unforeseen flooding, and to provide time to carry out necessary salvage; and*
- *staff training in techniques of conservation freezing and drying for damaged cultural objects, especially books.*

### 7.3.2 Increasing resistance to floods

Efforts to increase flood resistance must be based on adequate under standing of a building, its structural systems, construction materials and techniques, its evolution, history and conservation, drainage conditions at foundations, conditions of roof and downpipes, the property's heritage values and its likely performance when confronted by a flood.

All physical alterations to improve resistance to flooding must be based upon adequate survey and must meet requirements established by local authorities.

Design of physical improvements should ensure the following:

- any repairs or upgrading measures proposed will not result in the loss or impairment of the special interest or integrity of the historic property;
- where new materials and reinforcement techniques are proposed, these should be compatible with the existing materials, and be durable and reversible as far as is practicable; if these conditions cannot be met, alternative proposals should be commissioned and evaluated;
- analysis of foundation water penetration resistance at and below ground level, and upgrading, where necessary, by improving external drainage and application of water resistant coatings;

- assessment of roofs and their water shedding performance, including drainage, and introducing any improvements necessary to elements of these systems;
- analysis of measures — particularly at foundation and ground floor levels — to reinforce building openings with shutters or temporary closures in order to resist water penetration; and
- preparation for salvage of threatened objects, including identification and location of significant objects, preparation of possible storage and emergency conservation areas.

The opportunity to upgrade flood resistance should always be pursued when a building is the subject of a major programme of repairs, alteration or extension.

All improvements and strengthening work should be fully documented, allowing for continuing performance monitoring and upgrading required to meet current building life, safety and health standards, as required.

### 7.3.3 Flood early warning and detection systems

Development of effective flood early warning and detection system involves the need for continuous documentation in a number of important areas:

- *meteorological records and forecasts, predicting precipitation levels;*
- *knowledge of the impact of past precipitation of water flows in river systems;*
- *measurements of water flows and heights at key monitoring stations within a river system; and*
- *knowledge of flow control measures and historical effectiveness of such measures within the river system.*

### 7.3.4 Development of a response plan

Preparation of a plan for emergency action in the event of a flood should respond to the following considerations:

- Property occupants should work together with flood-protection officials to develop a response plan which clarifies:
  - *priorities for immediate action;*
  - *the respective roles of occupants, property users and emergency-response officials in an emergency situation;*
  - *special measures for the identification, salvage and conservation of significant objects and property fittings; and*

- ❑ *preliminary condition assessment to establish priority needs for stabilization, repair and for further assessment.*

- Providing training and preparing occupants and property staff, together with civil defence and public authorities in the region, according to local law, in recording, salvage and emergency repair, shoring, propping and emergency protection methods and practice, and in the implementation of security measures to counter theft, arson and other criminal activity. Training activity should be accompanied by the publication of technical advice, of survey and record data, and regular practice and exercises.
- Emergency-response officials must be trained in measures to care for significant cultural heritage in the course of carrying out their duties. Such training involves increasing consciousness of the value of cultural heritage and appropriate measures to ensure its conservation and care.

## 7.4 RESPONSE

As with fire and earthquakes, the effectiveness of flood response depends very much on the adequacy of advance planning. In the event of disaster, occupants, staff and emergency officials will have to depend on the response plans previously prepared to guide their actions to contain the flood and mitigate its effects.

To explore the adequacy of preparation for flood response, the following questions may be useful:

- For **emergency flood-response personnel:**
  - ✓ Have up-to-date flood-response plans been prepared for the site?
  - ✓ Have the response plans been reviewed by relevant emergency-response officials?
  - ✓ Do the provisions of the plan satisfactorily integrate concern for the site's heritage values?
  - ✓ Has the plan been effectively communicated to occupants, staff, residents and emergency-response crews for implementation?
  - ✓ Have the provisions of the plan been tested and verified in training and flood simulation exercises?
- For **occupants, residents and staff:**
  - ✓ Are occupants aware of their responsibilities in the event of flooding?
  - ✓ Do occupants have permanent access to the flood response plan?
  - ✓ Are they familiar with the provisions of the plan and prepared to carry out their part in its implementation?

- For local **flood-response officials:**
  - ✓ Have the officials responsible developed and reviewed the flood-response plan together with the relevant property managers?
  - ✓ Are emergency-response officials comfortable with those provisions which specify the nature of the special attention and care to be given to heritage elements, fittings and features?
  - ✓ Are members of the flood-response team aware of the provisions of the flood-response plan, and clear about their responsibilities for implementation?
  - ✓ Is the flood-response plan at hand and ready for immediate application and consultation during an emergency situation?

## 7.5 RECOVERY

After a flood, particular attention should be given to immediate condition assessment in order to plan for needed stabilization, repair or rebuilding. Analysis should be directed to evaluating:

- ✓ need for emergency shoring and propping;
- ✓ condition of structural members and building stability;
- ✓ condition of roof, downpipes and drainage system for handling rainfall;
- ✓ condition and structural soundness at possible entry points of water into building;
- ✓ presence of residual water and humidity within a structure, particularly in hidden areas, and need to pump remaining water out and dehumidify;
- ✓ examination of damage (structural or otherwise) caused by contact with floating debris;
- ✓ ease of repair and availability of replacement materials;
- ✓ availability of experienced and qualified professionals and craftspeople to carry out any repair and restoration needed;
- ✓ the availability of expert supervision for essential repair and upgrading work;
- ✓ condition of foundations; loss of lateral support or bearing as a result of soil shifts; and
- ✓ need for removal of significant artefacts.

Initial condition assessment should be the basis for the following actions:

- Structures should be stabilized to protect the public, to prevent further damage, to permit salvage operations for important objects or collections and to permit further detailed assessment of building condition. Professionals experienced in assessment of flood-damaged structures should be called upon to verify the carrying capacity, stability and soundness of building systems (including electrical, fuel supply and HVAC systems). Efforts to minimize the possibility of further damage should also be initiated: openings in the building should be covered, and buildings secured against vandalism and looting.
- Negative consequences of the flood should be addressed. Residual water, mud and debris should be removed by mechanical and physical means (suction pumps, sponges, cloths, etc.), and the building should be thoroughly dried through improvement of air flow and the use of dehumidifiers.
- Detailed condition assessment of the flood-damaged structure should be carried out. Where possible, non-destructive techniques should be used to look at hidden conditions; the installation of moisture monitoring equipment should be considered.
- Salvage recording and conservation measures for damaged objects, elements, and the structure should be initiated. The structure, valuable artefacts and fittings, including those dislodged, damaged or in danger of collapse, should be recorded through drawings and photographs *in situ,* and then carefully removed, under the supervision of conservation specialists, to a safe area for urgent conservation measures. A conservation centre for salvage work, including refrigeration facilities, should have been identified and activated as soon as a flood warning is issued.
- Security and fire alarm systems and on-site fire-fighting equipment should be re-installed and activated. Efforts to re-establish property security are important to carry out as quickly as possible after a disaster, since a property is then at its most vulnerable to subsequent disasters.
- Plans for repair or reconstruction of damaged structures should be prepared. Further works of any kind (repair, rebuilding, demolition, etc.) should be undertaken only after full consultation with heritage-conservation professionals with expertise in assessing flood damage and its consequences.

Chapter 8

# ARMED CONFLICT
# Developing a property-specific strategy to improve risk-preparedness for cultural heritage

## 8.1 DAMAGE TO PROPERTY

There is no particular type of damage uniquely associated with armed conflict. Damage resulting from armed conflict, depending on the nature of the armaments employed and the possibilities of secondary damages linked to the conflict (e.g., fire, flooding), may resemble the impact of any or all natural disasters.

The following types of damage to property, however, are often significant results of armed conflict:

- to **buildings and their contents:**
  - *full or partial destruction by bombs, shells and associated fire of struc-- tures and contents;*
  - *loss of stability, weather tightness, or both, as a result of shelling which only partly destroys walls and roofs;*
  - *damage to objects, collections and significant interior features and fit- tings by heat, smoke and combustion by-products; and*
  - *water damage resulting from efforts to arrest fire.*
- to **historic districts, cultural landscapes, archaeological sites:**
  - *damage to structures and interiors located in historic districts, cultural landscapes, archaeological sites as described above for buildings;*
  - *obliteration of landscape patterns and features through shelling and associated fire;*
  - *destruction of plants and animals and their habitats;*
  - *latent potential for future damage to property and people as a result of use of buried land mines by armed forces.*

## 8.2 THE CONTEXT: *THE CONVENTION FOR THE PROTECTION OF CULTURAL PROPERTY IN THE EVENT OF ARMED CONFLICT*

Governments have long been concerned that armed conflict provided opportunities — indeed, incentives for some of those involved — to destroy the cultural heritage of others. International conventions and agreements were concluded in 1899 and 1907 in the Hague, and in Washington in 1935, to attempt to define rules by which States Parties would agree to recognize and protect cultural heritage should they be engaged in armed conflict with each other. In May 1954, the *Convention for the Protection of Cultural Property in the Event of Armed Conflict* (generally known as the 1954 *Hague Convention)* was adopted; its provisions consolidated and built upon those of the earlier documents.

As of 30 April 1997, 90 States are party to the Convention and 77 of them to the Protocol to the Convention.

The highly visible losses of cultural heritage in the 1991 Gulf War; in the Balkan conflicts which followed the breakup of the former Yugoslavia (the bombing of Dubrovnik, the destruction of the Mostar bridge, the loss of hundreds of villages and related cultural landscapes); and at Angkor in Cambodia, provoked worldwide questions concerning the effectiveness of the Hague Convention. The symbol of the Convention — the Blue Shield — meant to be used to identify and protect significant cultural heritage was abused frequently in these recent conflicts; its presence became less an inhibition to attack than an invitation to those anxious to destroy important cultural symbols of the group with whom they were in conflict.

As a result of the discomfort of many countries with these evident difficulties, and as a result of long-standing concerns for the effectiveness of the Convention, UNESCO began in the early 1990s to examine the Convention's operations.

In November 1993, the General Conference of UNESCO reaffirmed that the object and purpose of the Hague Convention are still valid and realistic and that the fundamental principles of protecting and preserving cultural property in the event of armed conflict could be considered part of international customary law. The accompanying analysis[1] suggested that the Convention's objectives would be better achieved by efforts to improve its operational effectiveness rather than — as proposed by some — efforts to replace it with a new Convention. Discussions are currently (March 1998) continuing to determine an appropriate form for efforts to improve the Convention's operations.

A number of the provisions of the Convention are worthy of close attention.

1. The Convention concerns itself with both movable and immovable cultural property; the Convention's definition of cultural property, as set forth in Article 1

1 A study entitled "Review of the Convention for the Protection of Cultural Property in the Event of Armed Conflict," prepared in 1993 by Professor Patrick Boylan, a UNESCO consultant (see Sources).

*(Definition of Cultural Property)* — "irrespective of origin or origin or ownership" — covers the following:

> *"(a) movable or immovable property of great importance to the cultural heritage of every people, such as monuments of architecture, art or history, whether religious or secular; archaeological sites; groups of buildings which, as a whole, are of historical or artistic interest; works of art; manuscripts, books and other objects of artistic, historical or archaeological interest; as well as scientific collections and important collections of books or archives or of reproductions of the property defined above;*
>
> *(b) buildings whose main and effective purpose is to preserve or exhibit the movable cultural property defined in sub-paragraph (a), such as museums, large libraries and depositories of archives, and refuges intended to shelter, in the event of armed conflict, the movable cultural property defined in sub-paragraph (a);*
>
> *(c) centres containing a large amount of cultural property as defined in sub-paragraphs (a) and (b), to be known as "centres containing monuments."*

2. The key objectives of the Convention are contained within Article 3, *Safeguarding of Cultural Property* and Article 4, *Respect for Cultural Property.* Essentially, the parties involved in the conflict agree in times of peace to prepare appropriate strategies to protect cultural heritage, and in times of armed conflict, both to refrain from uses of cultural property and its immediate surroundings or of the appliances in use for its protection for purposes which might endanger them and to refrain from hostile acts directed towards such property.

***Article 3***

*"The High Contracting Parties undertake to prepare in time of peace for the safeguarding of cultural property situated within their own territory against the foreseeable effects of an armed conflict, by taking such measures as they consider appropriate."*

***Article 4***

*"1. The High Contracting Parties undertake to respect cultural property situated within their own territory as well as within the territory of other High Contracting Parties by refraining from any use of the property and its immediate surroundings or of the appliances in use for its protection for purposes which are likely to expose it to destruction or damage in the event of armed conflict; and by refraining from any act of hostility directed against such property.*

*3. The High Contracting Parties further undertake to prohibit, prevent and, if necessary, put a stop to any form of theft, pillage or misappropriation of, and any acts of vandalism directed against, cultural property. They shall refrain from*

*requisitioning movable cultural property situated in the territory of another High Contracting Party.*

*4. They shall refrain from any act directed by way of reprisals against cultural property."*

3. Article 6 of the Convention, *Distinctive Marking of Cultural Property,* and Article 10, *Identification and Control,* focus on the use of a distinctive emblem to identify important cultural heritage.

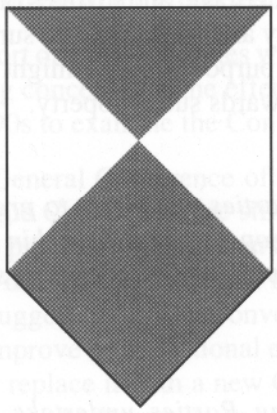
***Article 6***

*"In accordance with the provisions of Article 16, cultural property may bear a distinctive emblem so as to facilitate its recognition."*

***Article 10***

*"During an armed conflict, cultural property under special protection shall be marked with the distinctive emblem described in Article 16, and shall be open to international control as provided for in the Regulations for the execution of the Convention."*

Article 16, *Emblem of the Convention,* and Article 17, *Use of the Emblem,* further describe the intended use of the Blue Shield emblem in relation to significant cultural property.



***Article 16***

*"1. The distinctive emblem of the Convention shall take the form of a shield, pointed below, per saltier blue and white (a shield consisting of a royal-blue square, one of the angles of which forms the point of the shield, and of a royal-blue triangle above the square, the space on either side being taken up by a white triangle).*

*2. The emblem shall be used alone, or repeated three times in a triangular formation (one shield below), under the conditions provided for in Article 17."*

***Article 17***

*"1. The distinctive emblem repeated three times may be used only as means of identification of:*

*(a) immovable cultural property under special protection;*

*(b) the transport of cultural property under the conditions provided for in Articles 12 and 13;*

*(c) improvised refuges, under the conditions provided for in the Regulations for the execution of the Convention.*

*2. The distinctive emblem may be used alone only as a means of identification of:*

*(a) cultural property not under special protection;*

*(b) the persons responsible for the duties of control in accordance with the Regulations for the execution of the Convention;*

*(c) the personnel engaged in the protection of cultural property;*

*(d) the identity cards mentioned in the Regulations for the execution of the Convention."*

4. The provision of 'special protection' for registered cultural property and a limited number of "refuges" intended to shelter movable cultural property is described in Article 8, *Granting of Special Protection,* and Article 9, *Immunity of Cultural Property under Special Protection.* Refuges for movable cultural heritage created under these articles are considered to enjoy the same protection as registered cultural property.

***Article 8***

*"There may be placed under special protection a limited number of refuges intended to shelter movable cultural property in the event of armed conflict, of centres containing monuments and other immovable cultural property of very great importance, provided that they:*

*(a) are situated at an adequate distance from any large industrial centre or from any important military objective constituting a vulnerable point, such as, for example, an aerodrome, broadcasting station, establishment engaged upon work of national defence, a port or railway station of relative importance or a main line of communication;*

*(b) are not used for military purposes.*

*2. A refuge for movable cultural property may also be placed under special protection, whatever its location, if it is so constructed that, in all probability, it will not be damaged by bombs.*

6. *Special protection is granted to cultural property by its entry in the "International Register of Cultural Property under Special Protection". This entry shall only be made in accordance with the provisions of the present Convention and under the conditions provided for in the Regulations for the execution of the Convention."*

Following a recommendation of the General Conference in 1993, UNESCO contacted the States Parties to the Hague Convention and asked them to consider the possibility of nominating cultural sites on the World Heritage List to the International Register of Cultural Property under Special Protection. To date, several states have requested that UNESCO include their World Heritage sites on this Register.

***Article 9***

*"The High Contracting Parties undertake to ensure the immunity of cultural property under special protection by refraining, from the time of entry in the International Register, from any act of hostility directed against such property and, except for the cases provided for in paragraph 5 of Article 8, from any use of such property or its surroundings for military purposes."*

5. Article 18, *Application of the Convention,* describes the circumstances during which the Convention is to apply.

***Article 18***

*"1. Apart from the provisions which shall take effect in time of peace, the present Convention shall apply in the event of declared war or of any other armed conflict which may arise between two or more of the High Contracting Parties, even if the state of war is not recognized by one or more of them.*

*2. The Convention shall also apply to all cases of partial or total occupation of the territory of a High Contracting Party, even if the said occupation meets with no armed resistance.*

*3. If one of the Powers in conflict is not a Party to the present Convention, the Powers which are Parties thereto shall nevertheless remain bound by it in their mutual relations. They shall furthermore be bound by the Convention, in relation to the said Power, if the latter has declared that it accepts the provisions thereof and so long as it applies them."*

6. Parties to the Convention agree to undertake responsibility for dissemination and reporting on their activities. These provisions are contained in Article 25, *Dissemination of the Convention,* and Article 26, *Translations, Reports*.

***Article 25***

*"The High Contracting Parties undertake, in time of peace as in time of armed conflict, to disseminate the text of the present Convention and the Regulations for its execution as widely as possible in their respective countries. They undertake, in particular, to include the study thereof in their programmes of military and, if possible, civilian training, so that its principles are made known to the whole population, especially the armed forces and personnel engaged in the protection of cultural property."*

***Article 26***

*Furthermore, at least once every four years, they shall forward to the Director-General a report giving whatever information they think suitable concerning any measures being taken, prepared or contemplated by their respective administrations in fulfilment of the present Convention and of the Regulations for its execution."*

## 8.3 DEVELOPING A STRATEGY FOR THE PROTECTION OF CULTURAL HERITAGE IN THE EVENT OF ARMED CONFLICT

Strategies for protection of cultural heritage exposed to armed conflict must be developed at state or regional levels in order to improve conditions for protection for individual properties or sites. Development of such strategies need to take into account the following points:

- All plans of action and preventive measures should be developed in time of peace, through collaboration among military forces, local authorities, lawyersand heritage experts. They may be coordinated by a national advisory committee for the implementation of the Convention.
- Peace-time preventive measures could include the following preventive actions specifically related to armed conflict damage; preventive actions regarding fire (as described in Chapter 5 above), though not repeated here, are equally applicable:
  - *identification of significant cultural property and entering it in the Register provided for in the 1954 Hague Convention;*
  - *placing the emblem of the Hague Convention — the Blue Shield — on registered cultural property, as provided for in the Convention;*
  - *identification of refuges to which significant movable cultural property may be transported and cared for during times of conflict, as provided for in the Hague Convention;*
  - *collection and dissemination of pertinent information related to cultural heritage protection in case of armed conflicts;*

- *preparation of manuals for property managers and owners related to protection techniques and principles, taking into account the evolution of military technology;*
- *provision of direct assistance to managers of registered or significant cultural property in providing physical buffers and protective envelopes for buildings, building elements and objects;*
- *advance clarification of the most effective means to bring in heritage experts required to assess building conditions following incidents of shelling or attack;*
- *ensuring that designated refuges provide stable conditions for object storage, and are well supplied with conservation materials, tools, work spaces and object first-aid manuals;*
- *preparation of manuals for use by line military personnel, written in easy-to-understand non-technical language, including implications of the Hague Convention applications, and maps locating all protected sites and monuments; and*
- *training of military forces to work closely with cultural heritage experts, to improve understanding of appropriate actions to be undertaken in times of conflict. Training should be directed at senior personnel of sufficient rank to have the power to enforce compliance with provisions of the Hague Convention, or similar agreements, during times of conflict.*

Military forces may wish to designate a heritage protection officer, to assist with preventive measures, in monitoring compliance with adopted measures, and in ensuring adequate follow-up and care for heritage during conflict. The task description of such an officer should include the following elements:

- *giving advice to chief commanders of military forces in areas where there is cultural heritage;*
- *promoting respect for cultural property during military operations, through mapping, dissemination of information and ongoing training;*
- *preparing advice and recommendations for aid or salvage during emergency situations; and*
- *avoiding the use of historic buildings for military purposes.*

During armed conflict, regular monitoring and inspection of the condition of significant cultural property should be undertaken as a basis for follow-up actions. Heritage protection officers or designated military personnel might become involved in the following:

- *providing urgent advice concerning access to aid, removal of threatened objects, the availability of teams of conservation experts, the application of the provisions of the Hague Convention, and the status and use of refuges in emergency situations;*
- *negotiating with those threatening registered or inscribed cultural heritage to increase compliance with the provisions of the Hague Convention;*
- *carrying out urgently needed salvage recording or documentation of threatened or damaged cultural property;*
- *providing transportation for conservation experts to increase their mobility;*
- *taking charge of emergency repairs to the extent permitted in the 1954 Hague Convention (Article 5);*
- *helping local authorities in charge of cultural heritage to elaborate a detailed recovery plan for damaged monuments; and*
- *using available dispositions to punish those responsible for severe looting or damage to cultural property.*

Chapter 9

# OTHER HAZARDS
## Developing a property-specific strategy to improve risk-preparedness for cultural heritage

Many other hazards (such as tsunami, avalanches, land and mud slides and flows, winds or tropical storms), and hazards of human origin (inadequate maintenance, industrial pollution and accidents) can also have negative impacts on property and cultural heritage. These are discussed below in less detail than the hazards treated previously (fire, earthquakes, floods and armed conflict), but are nevertheless important to take into account in developing overall site-preparedness strategies. In some regions of the world, particular hazards not analyzed in this manual (e.g., ice-storms, polar storms, volcanic eruption and ash fallout, seasonal high tides, drought) may also have great importance. The approach followed for fire, earthquakes, floods and armed conflict can be used as a rough guide in helping develop site-specific strategies for most other hazards.

Particular concerns in dealing with some of the most important of these additional hazards are considered below.

### 9.1 TSUNAMI

*Tsunamis* (or tidal waves) are hazards of potentially high importance in coastal regions. Disaster planning for tsunami should take into account the following:

- *probability of tsunamis occurring in the region or in nearby locations which might affect the region;*
- *probability of tsunami height and run-up (penetration inland); zoning maps should show areas that would be submerged at various run-up heights; and*
- *sensitivity of the region's particular cultural heritage to tsunami-type waves.*

Possible means for improving coastline protection are limited. These may involve construction of off-shore barriers to absorb impact. Mitigation efforts are usually directed at structural reinforcement of buildings located in zones of high run-up.

### 9.2 AVALANCHES, LAND AND MUD SLIDES AND FLOWS

Avalanches and landslides are hazards of great importance in mountainous or hilly regions. These can also be related to other hazards; mud slides often occur during

floods, in areas where rainfall is high, and where surface cover has been removed or eroded.

Disaster planning for avalanches and landslides should take into account the following:

- *use of maps locating areas of past avalanches and landslides;*
- *assessment of slope stability; type and composition of soil layers; and the general susceptibility of soil layers to avalanches and slides (past events);*
- *obstacles in the path of slides, flows and avalanches;*
- *extraneous factors, such as water saturation, interference by construction works, seismic activity;*
- *systematic mapping of regions, illustrating significant cultural heritage properties threatened by possible avalanches or landslides.*

Possible protective measures and works could include:

- *drainage of slopes, and slowing of infiltration and percolation of water;*
- *use of retaining walls and plantings;*
- *research to improve understanding of the function of forest and other ground cover; and*
- *control of land use and exploitation.*

### 9.3 WINDS OR TROPICAL STORMS (HURRICANES, TYPHOONS, ETC.)

Storms associated with high winds and precipitation are hazards typical of coastal areas in tropical and sub-tropical climates. Disaster planning for such events should take into account the following:

- *probability assessments for the intensity and frequency of storms; data should estimate velocities, duration and prevailing direction;*
- *topographic features which may protect or expose significant heritage properties;*
- *the possible effects (negative or positive) of other structures, vegetation or landscape features on exposed elements;*
- *the adequacy of roof cladding and supporting structures to withstand wind forces (e.g., resistance to lift pressures from wind (suction), strength, fastenings, etc.);*

*Preparedness must go beyond anticipation of conventional hazards. The Montreal ice storm of 1998 – caused by an unprecendented five continuous days of freezing rain – led to the collapse of most of the Province of Quebec's power grid, and almost resulted in the evacuation of the entire city from the Island of Montreal. (Photo by Meryl Oliver)*

- *the stability of towers, spires, pinnacles, cupolas, parapets and other exposed elements, and their possible need for additional anchoring; and*
- *presence of large, laterally unsupported walls.*

Protective measures in the face of violent storms should be focused on efforts to reinforce structural ability and to protect windows and openings against flying debris, using shutters or other temporary means of closure.

## 9.4 HAZARDS OF HUMAN ORIGIN

Anthropogenic hazards include vandalism, theft, looting, arson, the use of explosive devices (such as Molotov cocktails) and accidents (e.g., vehicle crashes). Measures contained within fire protection strategies will be useful to counter most effects of unwanted intrusions and related damage.

## 9.5 INADEQUATE MAINTENANCE

Low levels of maintenance can reduce building life, and also increase the likelihood of associated hazards occurring. Such hazards can include falling masonry (particularly building parapets), and collapsing structures and foundations (perhaps weakened by loss of connections, or undetected rot). A commitment to high levels of maintenance is one of the key elements of sound property stewardship.

## 9.6 INDUSTRIAL POLLUTION AND DISASTERS

Industry is a source of potential hazards at many levels: airborne pollutants slowly erode structures through deposition, or through their dissolving action in rainfall. Industrial activity often results in the release of toxic substances into adjacent soil or water. Finally, industrial accidents can also devastate the properties on which they occur and nearby properties.

Property preparedness plans should take these factors into account, particularly if they are near major industrial installations or in highly industrialized settlements.

A preparedness plan of action for particular properties should integrate concerns arising for all relevant industrial hazards. Education programmes should train soldiers, firemen, policemen and all those who are working for public security in integrated approaches to disaster response. In addition, training programmes should highlight the possible negative consequences of particular hazards for cultural heritage, and indicate appropriate remedial measures.

Chapter 10

# GUIDELINES FOR DEVELOPING SITE-SPECIFIC PREPAREDNESS PLANS

The following guidelines are meant to provide a reference checklist for managers of cultural properties who are involved in developing preparedness plans for their site. These measures are meant to acknowledge factors of particular importance for cultural heritage, and are aimed at complementing the general structures for risk-preparedness already in place.

Checklist measures are presented for use in advance of, during and following disasters and conflicts. Finally, a proposed *Checklist for Damage Assessment* is provided to aid reaction in an emergency-response situation.

## 10.1 GUIDELINES FOR ADVANCE PLANNING

- Documentation, inventory and survey of properties
  - ✓ designation of cultural properties requiring special care in emergency;
  - ✓ analysis of the heritage values and qualities of designated properties;
  - ✓ up-to-date documentation of the current state of properties (both interior and exterior), sufficient to permit reconstruction or replacement;
  - ✓ ongoing education of architects and engineers in traditional techniques of construction useful in disaster response, and on the benefits of performance-based analysis; and
  - ✓ disaster-response history of the property including, where possible, clarification of lessons emerging from such experiences.
- Risk analysis
  - ✓ nature of threats (hazards), degree of threat (vulnerability) and related risk (hazard vulnerability);
  - ✓ evaluation of areas where the property might be vulnerable to damaging weather phenomena and accompanying recommendations to reduce potential damage;
  - ✓ assessment of risk to building substructure, drainage systems, water lines, gas lines, electricity, telephone and other installations, and recommendations concerning how these can be better protected in emergencies;

- ✓ a list of the more common emergencies to be expected on the properties;
- ✓ thematic maps of risks, illustrating likely areas of impact for specific hazards; and
- ✓ insurance to cover risk; insurance should cover all hazards in order to cover liability for emergency-response activities and any necessary reconstruction work.

• Developing a response plan for emergencies

- ✓ clarify the expected chain of command and delegation during emergencies;
- ✓ ensure adequate knowledge of such arrangements by all concerned;
- ✓ prepare emergency teams (expertise and resources); establish an operational base for emergency teams and support provisions (e.g., fuel, generators, emergency lighting, emergency lists); emergency team preparations should also include preparation and maintenance of an on-site data-base (emergency team leader, members and phone numbers, phone numbers of important contacts (including building owner, site manager, site disaster-response officials, local authorities, fire and police services, available experts, companies offering transportation and conservation (refrigeration) services, plumber, electrician, janitor)).
- ✓ response plan: clarification of priorities, actions and responsibilities; the action plan should be flexible and adaptable to a variety of circumstances and needs;
- ✓ emphasis should be given to training staff; when knowledgeable about the contents of response plans and involved in their conception, staff gain ability to follow emergency instructions and to serve as emergency team members when a designated emergency-team member is not available;
- ✓ the response plan should integrate appropriate measures for all relevant hazards;
- ✓ incorporate mechanisms for continuous review and updating of a property's response plan, including transmission of important information to key people;
- ✓ include provision for ensuring, in conjunction with safety inspections, that approved emergency-response plans are tested and kept current; and
- ✓ lists of qualified conservation specialists, available for salvage or conservation rescue operations, should be developed and maintained current.

- Mitigation activity in advance of disasters
  - ✓ retrofitting measures to strengthen structures (roofs in hurricane areas, seismic reinforcement);
  - ✓ provision for storage, transport and protection of threatened objects and sites;
  - ✓ emergency conservation preparations, including ensuring availability of a refrigerated vehicle for freezing collections damaged by water, and for transfer of damaged objects to freeze-dry facilities for repair; and
  - ✓ improving access to mitigation expertise and models.
- Financing framework
  - ✓ ensure availability of emergency funds for immediate needs; and
  - ✓ long-term financing provisions for necessary repair and reconstruction.

## 10.2 GUIDELINES FOR REACTION DURING DISASTER OR CONFLICT

- Mobilization of local resources — using the response plan. The response plan should clarify priorities and appropriate measures to:
  - ✓ ensure on-site safety before implementing emergency measures;
  - ✓ save people;
  - ✓ alert others, including local emergency centres and rescue units;
  - ✓ save personal valuables, and important cultural heritage objects and collections;
  - ✓ limit or arrest the spread of the hazard where possible; and
  - ✓ plan and continue emergency services.
- Mobilization of emergency teams. On arrival, the emergency team should be prepared to give priority to the following:
  - ✓ communicating with emergency agencies at municipal, regional and state levels;
  - ✓ clarifying their authority and mandate for action; and
  - ✓ establishing on-ground accommodation and liaison arrangements.

- Assessment and documentation. Conservation professionals on the emergency team, or acting independently, should be involved in assessments to clarify:
  - ✓ measures required for short-term stabilization, security and safety;
  - ✓ priorities for long-term repair;
  - ✓ instances of loss and imminent loss; and
  - ✓ need for further detailed survey.

Use of the *Checklist for damage assessment* which follows in Section 10.4 is recommended as a means of systematizing the collection and organization of relevant information.

## 10.3 POST-DISASTER OR POST-CONFLICT GUIDELINES

- Rebuilding and reconstruction
  - ✓ understanding of applicable conservation principles and standards;
  - ✓ involvement of local authority in issuing permits and establishing design standards;
  - ✓ education and training programmes for the public, contractors, designers, politicians and other involved;
  - ✓ identifying sources and availability of appropriate replacement materials and suppliers;
  - ✓ determining those areas of damaged properties which are safe to use;
  - ✓ thorough inspection of utility systems after emergencies, to check for damaged live electrical wiring, broken gas lines, steam and water piping, and damaged sewerage and drainage systems; and
  - ✓ evaluation of the effectiveness of the response plan and recommendations for improvement of existing preparedness systems and implementation manuals.

## 10.4 SUMMARY CHECKLIST FOR DAMAGE ASSESSMENT

The following *Summary Checklist* provides a brief overview of the important areas that initial damage assessment should attempt to cover.

## SUMMARY CHECKLIST FOR DAMAGE ASSESSMENT

Property identification

— Form filled out by:
— Name of building:
— Address:
— Construction date:
— Use (residential, religious, civil, other):
— Description (size, construction, materials, style if applicable, other):
— Name of the owner:
— Individual in charge:

Damage assessment

— Date of damage:
— Type of damage — 1: External damage
— Source: lack of maintenance, neglect, fire, smoke, flood, earthquake, armed conflict (small arms, mortars, rockets, explosives, other), collateral, other (specify)
— Impact (be specific):
— Light damage (roof, wall, decorative aspects)
— structural damage
— severe damage (unusable without reconstruction)
—destroyed (only foundations left)
– Type of damage — 2: Internal damage
– Source: theft, vandalism, fire, earthquake, armed conflict, other (specify)
— Impact (be specific):
— interior of building affected (walls, decoration, ceilings)
— contents stolen or damaged (paintings, lights, furniture, decoration)
— storage facility (for salvaged objects)

Responsibility for damage?

Situation of surroundings?
— damaged
— untouched

Sources of the information acquired:
— Direct observation
— Documents (manuals, pictures, emergency measures)
— Local authorities
— Local people
— Witnesses
— name
— address
— prepared to testify?

Attention given to building after damage:
— Entrances limited or closed?
— Danger notices posted on property?
— Barriers to limit access?
— Emergency works (covering of roofs, shoring of walls and structures, transportation of salvaged objects)?
— Repairs and restoration works? — Legal status in armed conflict situations
— Were the states concerned parties to the Hague Convention? If so, did they observe its provisions?
— Was the Hague Convention emblem placed on buildings?

Chapter 11

# IMPROVING RISK-PREPAREDNESS FOR CULTURAL HERITAGE AT THE NATIONAL LEVEL

## 11.1 INTRODUCTION

The capacity of managers of particular properties to improve risk-preparedness for cultural heritage is very much a function of the overall climate for risk-preparedness established within national, regional and local policies and practices. It is worth reviewing the relationship between prevailing conditions and management practices at field levels.

There are only a small number of countries where the conservation and risk-preparedness fields routinely collaborate. Holland has long taken an interest in strengthening the protection given to cultural heritage in the face of armed conflict and disasters, as its support for the Hague Convention vividly demonstrates. The Government of Switzerland's Federal Office for Civil Protection has developed a very sophisticated programme of documentation and protection of cultural heritage in the face of conflicts and disasters. The USA Federal Emergency Management Agency (FEMA) has recently begun to work more closely with USA cultural heritage agencies and networks to improve risk-preparedness for cultural heritage. Encouraged by ICOMOS and the Inter-Agency Task Force, ICOMOS Committees in Canada and Sri Lanka have begun to develop national models of preparedness for cultural heritage which reflect their particular circumstances.

In most countries, given the mandate enjoyed by national and regional governments to maintain public order and safety for the benefit of all, emergency-response officials at upper levels are empowered to assist at local levels during emergencies. If practices at national and regional levels are indifferent to heritage concerns, then these concerns may suffer in response and recovery situations.

## 11.2 ELEMENTS OF IMPROVED RISK-PREPAREDNESS

It is important that those concerned with improving the treatment of cultural heritage in times of disaster or conflict work to increase the sensitivity and capacity of emergency-response officials, at national and regional levels, to integrate heritage protection into existing practices.

These efforts might focus on a range of targets, depending on circumstances and needs within the country. Objectives should include:

- strengthening the framework for collaboration between heritage-conservation officials and emergency-preparedness officials, through activities such as:

- *symposia at national, regional and local levels (such as those organized in Canada and in Japan), thus providing opportunities for professionals and officials from both fields to explore the benefits of collaboration;*
- *setting up working groups with representatives of both fields to pursue integration in a structured fashion of heritage concerns and emergency planning;*
- *establishing networks to facilitate exchanges among professionals and officials in the two fields;*
- *in advance of disasters, negotiating agreements between state, regional and local officials, anticipating necessary response measures and procedures appropriate for cultural heritage protection in times of emergency; and*
- *ensuring the availability of appropriate conservation expertise during times of emergency, implying developing and maintaining databases of experts and networks.*

- Improving the availability of funding to improve risk preparedness for cultural heritage:
  - *putting in place national or regional reserve funds which can be called upon quickly in times of disaster to stabilize or rebuild significant cultural heritage.*

Improving the sensitivity of emergency-response mechanisms toward cultural heritage:

- *ensuring all those involved in various line-of-command structures share understanding of and interest in response measures which will protect and extend the life of threatened cultural heritage.*

- Strengthening efforts to build documentation resources adequate to ensure cultural heritage is appropriately identified and protected during response operations, involving:
  - *ensuring that national or regional guidelines include standards for recording and documentation of cultural heritage. In this context, the proposed ICOMOS International Recording and Documentation Guidelines should constitute an excellent model for adaptation at national and regional levels; and*
  - *developing integrated databases to enhance sharing of information about heritage sites, their values and associated risks.*
- Improving training and education materials and opportunities available to cultural heritage managers, staff and occupants, implying:

- ❑ *use of existing university and educational infrastructures to develop and offer courses and training materials integrating cultural heritage within emergency response; and*
- ❑ *development of guidelines for specific sites to assist staff to improve emergency-preparedness for cultural heritage sites.*

• Increasing general awareness of the value of working within a cultural-heritage-at-risk framework, by:

- ❑ *encouraging development of general interest promotional mechanisms (including videos, media articles, annual fire protection days, etc.) to strengthen integration of concern for cultural heritage into emergency-response infrastructures.*

## 11.3 A PROCESS MODEL FOR IMPROVING RISK-PREPAREDNESS FOR CULTURAL HERITAGE

The process model proposed below is based on the experiences of ICOMOS Canada in developing a Canadian model of risk-preparedness for cultural heritage. As an NGO, ICOMOS Canada had to build a cooperative framework within which partners could not only devise a collective strategy, but also develop programmes in their own areas.

While the context for the Canadian Model has been the particular set of jurisdictional relationships that characterize Canada (whereby the Constitution delegates responsibility for property rights — touching both cultural heritage and disaster-preparedness — to the provincial level, with a resulting general lack of coordination in national- and provincial-level heritage and disaster-preparedness structures and mechanisms), the process employed is worth studying by any country interested in improving the national framework for risk preparedness for cultural heritage.

### *Step 1. Form a national working group*

A working group of relevant individuals should be formed to guide initial volunteer efforts and to begin to foster wider interest among institutions and government agencies with responsibilities in the sector.

### *Step 2. Identify tangible objectives*

Initial discussions should define tangible, achievable goals. These objectives may need to be adjusted over time as research and changing circumstances reveal differing needs.

### *Step 3. Identify potential partners*

At an early stage, efforts should be made to draw up an inventory of groups with a potential stake in disaster-preparedness for cultural heritage at the national level. Preliminary meetings should help participants build a sense of shared ownership

in the joint venture, but also identify groups missing from the general discussion. Preliminary meetings can also identify partners able to commit themselves to action, and those more interested in acting as distribution points for information.

***Step 4. Identify a pilot project to build interest and commitment among potential partners***

A tangible short-term project should be defined to give the various partners the opportunity to channel their energies in positive directions, and to develop longer-term working relationships.

Thus, ICOMOS Canada's project was a *Summit Meeting,* bringing together 70 potential partners from government at all levels from national to municipal; from all sectors of the conservation field, including those concerned with objects and collections; and from the emergency-response field. The meeting was intended to build a permanent national forum for exchange.

***Step 5. Explore relevant obstacles and opportunities***

Once exchange has begun, research is necessary to improve understanding of a situation and the various associated needs. Research need not initially result in a full portrait of activity in the field, but rather should identify key obstacles to and opportunities for improving risk-preparedness for cultural heritage.

***Step 6. Explore the commitment of partners***

With potential partners identified, and a field of potential actions defined (relative to identified obstacles and opportunities), the degree to which individual partners are prepared to commit themselves to address specific obstacles or opportunities should be explored.

ICOMOS Canada's Summit Meeting used a *Declaration* (see Appendix A) to identify specific challenges confronting cultural heritage (increasing vulnerability, poor levels of preparedness, coordination difficulties) and opportunities to improve care (awareness-building, collaboration, capacity-building at individual and community levels), and ultimately to link these to particular potential partners.

***Step 7. Strengthen the commitment of partners***

The overall framework of cooperation should be examined: are there missing partners? Are adjustments necessary?

Levels of commitment within key partners are likely to increase over time as they incorporate the goals adopted into their regular budgeting and planning cycles.

***Step 8. Coordinate follow-up***

It is important that as the process develops it is followed up, both by consolidating network effectiveness (sharing confirmed projects provides opportunities for all partners to contribute), and by building cooperation in all directions.

**CASE STUDY:**
**Government of the Netherlands Handbook on Protecting the Cultural Heritage in Emergencies (January, 1991)**

This Handbook (an English translation of which constitutes Appendix IX in Patrick J. Boylan's 1993 *Review of the Convention for the Protection of Cultural Property in the Event of Armed Conflict)* introduces the leadership displayed by the Dutch Government in protecting cultural heritage at risk. The Handbook was designed to assist all those individuals or agencies involved in protecting cultural heritage in emergencies, whether peacetime disasters or during moments of international tension from and at all levels of government. The Handbook outlines the responsibilities of various authorities for the protection of the Dutch cultural heritage within the framework provided by the Cultural Protection Inspectorate (ICB), managed by the Ministry of Welfare, Health and Cultural Affairs, the objects and sites to be protected, the dangers to be protected against, the 'when' and 'how' of protection, related organizational, practical and preventive measures and operational funding and includes lists of the 'top 100' protected buildings, and the 'top 10' objects of cultural value.

The Handbook clarifies the organizational framework — largely dependent on a network of provincial, regional and general inspectors — set up by the ICB, and constitutes a useful model for any country interested in cost-effective approaches to improving risk-preparedness.

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Ministerie van O.C.W., directie Cultureel Erfgoed
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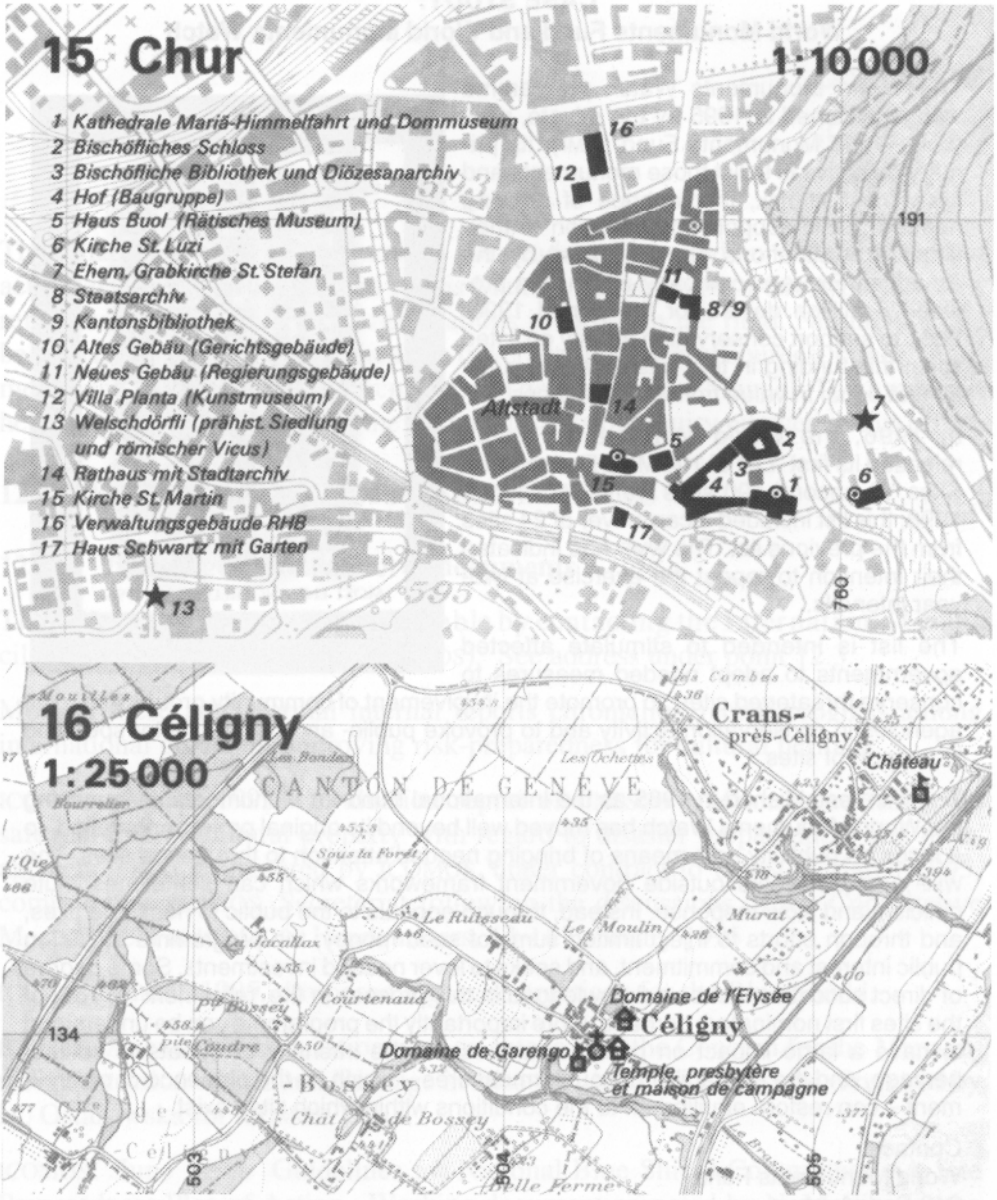
E-mail dce@minocw.nl

## CASE STUDY:
## The Swiss System for the Protection of Cultural Property

One of the most advanced national systems for improving risk-preparedness for cultural heritage is in Switzerland. The government has taken particular interest, over time, in developing an integrated set of policies, tools and mechanisms to improve risk-preparedness for cultural heritage. The PBC (la Protection des biens culturels) works to ensure the coherent implementation of various mechanisms at several levels: at the federal level, the 'Service de la PBC' works closely with Federal Departments of Justice, Police and the Federal Office of Civil Protection; each canton maintains a regional office; and at municipal levels, PBC personnel are involved in civil protection efforts.

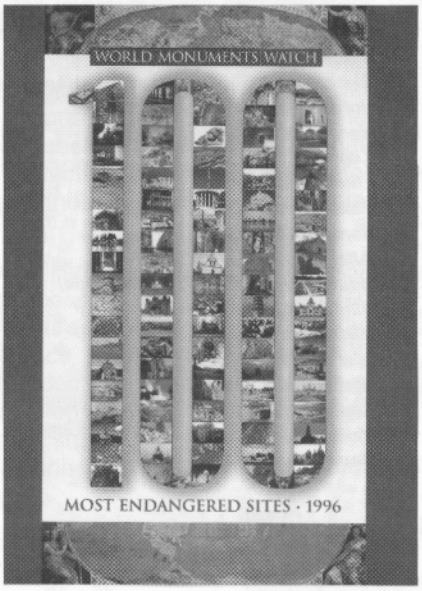
The PBC, which operates under the symbol of the Hague Convention's Blue Shield, was established to preserve to the greatest degree possible the Swiss cultural heritage from the consequences of armed conflicts, and ensure respect for cultural heritage by involved parties, and to assure in times of peace various protective measures: improved organization of the PBC service, posterity documentation (adequate to permit reconstruction of damaged objects and sites), development of cultural heritage inventtories (priorities for protection) and development of shelters for threatened objects or building fittings. These efforts are supported by a series of preparedness manuals and training courses.

Contact :
Office fédéral de la protection civile (OFPC)
Service de la protection de biens culturels
3003 Berne, Switzerland.




*The Swiss protection programme includes detailed maps on which inventoried cultural properties are located. The maps depict properties in both urban and rural settings, as here in Chur and Céligny.*

## CASE STUDY:
## World Monuments Fund and World Monuments Watch




The World Monuments Watch programme was established in 1995 by the private, non-profit World Monuments Fund (WMF); its primary objective is to list those monuments and sites most at risk, in the hope of drawing needed public support and attention to their situation. WMF efforts are supported by the American Express company which has provided 5 million dollars for the period 1996-2001 to support conservation activity on listed sites; this funding in turn has attracted sums almost equal in value from other sources.

In 1996, the World Monuments Watch released its first "List of 100 Most Endangered Sites." A second 100 sites were identified in 1998; this list included a carry-over of 24 sites from the previous list. The WMF has indicated their intention to repeat the exercise at two-year intervals.

The list is intended to stimulate affected governments to adopt needed measures to conserve threatened sites, to promote the involvement of community groups and local agencies in conservation activity and to provoke public- and private-sector spending in support of sites.

The WMF, established in 1965 as the International Fund for Monuments, in launching the World Monuments Watch has moved well beyond its original project orientation, to a focus on publicity as a means of bringing needed attention to threatened sites. The WMF process works outside government frameworks which can sometimes mute criticism and slow response. Instead, through appeals to the public to nominate sites, and through efforts to inject limited sums of seed money, the programme builds on public interest and commitment, and seeks to lever needed investments. Some degree of direct success must be acknowledged in this process in the 'retirement' of 75% of the sites first nominated; perhaps, more importantly the programme can be understood to have a large impact on public awareness of the intensity of threats to cultural heritage, and the availability of countermeasures – which, in the presence of commitment – can restore equilibrium to the conditions within which sites exist.

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Chapter 12

# SOURCES

This chapter provides opportunities for readers interested in following up on activities or projects mentioned in this Manual. Sources are of two types: written references, and addresses of organizations involved in the field. No attempt has been made to provide comprehensive coverage of all useful sources; rather, those mentioned have proved of particular use in developing the Manual. Their mention here provides an indication of the principal tracks of inquiry pursued in this effort.

## 12.1 WRITTEN AND AUDIOVISUAL SOURCES

### 12.1.1 Inter-Agency Task Force documents

The following documents are available by contacting the International Council on Monuments and Sites (ICOMOS). See address under point 12.3.

Most of these are informal internal reports chronicling recent progress among international groups in improving risk-preparedness for cultural heritage.

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# DECLARATION OF QUEBEC

**ICOMOS Canada Blue Shield Summit Meeting, Quebec City, 16-17 September 1996**

The Quebec Museum of Civilization played host to a first Canadian Summit Meeting on Cultural Heritage and Disaster Preparedness on September 16 and 17, 1996. Organized by ICOMOS Canada with support from UNESCO, the National Capital Commission of Quebec, ICOM Canada, the Department of Canadian Heritage and the University of Montreal, the meeting brought together individuals from the broad spectrum of the cultural heritage world (archives — museums — conservators' organizations — built heritage) and the disaster preparedness/civil protection field to forge new collaborative alliances to improve the care of cultural heritage threatened by catastrophe, natural or man-made. International participants from Holland, Switzerland, Japan, Former Yugoslav Republic of Macedonia, the USA, England, UNESCO, ICOMOS and ICOM shared experiences with Canadian speakers from the Department of Canadian Heritage (Parks Canada and the Heritage Policy Branch), the National Archives of Canada, the Canadian Conservation Institute, ICOMOS Canada, ICOM Canada, Protection Civile Québec, the Montreal Urban Community's Emergency Preparedness Unit, La Commission pour la Capitale Nationale de Québec, and many others.

The two days of discussions were preceded by a visit organized by Quebec's Ministry of Culture and Communications on Sunday, September 15, to Chicoutimi and the Saguenay region to view first-hand the results of the summer's floods and to talk with officials and citizens about their experiences. The meeting itself used a series of workshops built around a dozen international and national perspectives to define a 'Declaration of Quebec,' reflecting participants' shared views of challenges and opportunities confronting those trying to improve conditions in the field.

The Summit Meeting was a first major step in ICOMOS Canada's efforts to respond to challenges offered by ICOMOS International (in the context of its Blue Shield Initiative) to ICOMOS National Committees to develop grass-roots models of cooperation and exchange at the national level for cultural heritage at risk. A final session, presided over by Roland Arpin, Director of the Quebec Museum of Civilization, guided participants to a consensus around the articles of the Declaration. UNESCO s Cultural Heritage Division has taken particular interest in encouraging ICOMOS Canada to develop a 'Canadian model' for adaptation within similarly complex jurisdictional contexts elsewhere in the world.

**1st National Summit on Heritage & Risk Preparedness**
**Quebec City, September 1996**

# QUEBEC DECLARATION

## Given the following

## Challenges

The ever present and increasing vulnerability of Canadian and world cultural heritage in the face of disasters and other events threatening the continuing life of that heritage;

The generally poor state of preparedness for the protection of Canadian cultural heritage in times of emergency;

The administrative obstacles limiting effective coordination among authorities responsible both for cultural heritage and for emergency response at federal, provincial and municipal levels.

## Opportunities

Existing emergency response infrastructure and mechanisms in Canada capable of integrating concern for cultural heritage, and the evident interest shown by officials responsible for emergency response to respond to concerns for increasing care and attention given to cultural heritage;

The leadership of some Canadian institutions (e.g., National Archives of Canada) in developing preparedness models of value and interest for other groups and institutions;

The focus offered by the existing international Blue Shield initiative for improving the situation in Canada, given:

- The key role played by Canadians in the international movement (that is in the Inter-Agency Task Force Round Tables on the subject initiated by ICOMOS in 1992, and held regularly in Paris since then);
- The interest of UNESCO and ICOMOS in developing a "Canadian model" of risk preparedness;
- The potential offered by the creation of the International Committee of the Blue Shield whose first act was to respond to the Saguenay floods.

**Therefore, we the participants of the First National Summit on Heritage and Risk Preparedness in Canada held at the Musée de la Civilisation in Québec, on September 16-17, 1996, agree to pursue objectives in the following areas:**

### Awareness

Increase appreciation of the nature and value of cultural heritage among those responsible for heritage and emergency response, and increase knowledge and understanding of potential risks and associated impacts of disasters of natural, technological and social origin threatening the heritage.

Increase mutual awareness of emergency response management concerns and cultural heritage management concerns:

- Affirm importance of cultural heritage for those threatened by loss;
- Recognize strong link between effective heritage protection and clear identification of heritage values in the built environment;
- Better continuing appreciation of the concerns of the public, the youth and the media;
- Improve understanding of local authorities of concerns for cultural heritage protection.

### Collaboration

Establish permanent structural links among all those involved with cultural heritage conservation (archives, libraries, museums, built environment) and with emergency response authorities (civil security [and protection], emergency response, public security, defence):

- Identification of potential partners (governments, institutions, corporations and individuals) and their interests;
- Developing network(s) for exchange among those concerned with these issues at local, national and international levels;
- Ensuring effective communication among network members (e.g. electronic mail, newslists);
- Providing occasional forums for exchange among network members, including follow-up to this Summit meeting;
- Developing Task Force/Working Group to guide collaboration following the summit.

### Building local capacity

Clarify roles and responsibilities of local authorities in heritage protection (decision-making structures in times of emergency; policies for territorial environmental planning and management).

Improve capacity of local authorities, services and local institutions to improve care for cultural heritage threatened by disasters.

- Integrate concern for cultural heritage in existing structures for risk management and emergency response (for example, in methods of risk assessment, intervention planning and implementation);
- Improved knowledge of appropriate "models" in other contexts;
- Improved training for responsible officials and managers;
- Increased opportunities for volunteer participation.

**Strengthening enabling framework for heritage protection**

At local, regional, provincial, national and international levels:

- Develop and install early warning detection and surveillance systems;
- Improved databases of experiences and success models for consultation and improve accessibility to databases;
- Ensure commitment of authorities concerned to mobilization of appropriate professional experience in times of disaster;
- Development of emergency response mobilization plans.

In Québec, on September 17, 1996.

# THE KOBE/TOKYO DECLARATION ON RISK PREPAREDNESS FOR CULTURAL HERITAGE

The Kobe/Tokyo meeting on risk-preparedness for cultural heritage held in January 1997 was prompted by the desire of the Japanese authorities responsible for cultural heritage to derive what lessons could be gained from the Kobe (or Great Hanshin) Earthquake of January 1995, in order to improve risk-preparedness for Japanese cultural heritage, and also to extend the discussion to other countries and agencies interested in similar objective. The meeting, whose published proceedings demonstrate the wide range of themes treated, the diversity of countries involved in the discussions and the scope of inquiry (ranging from objects conservation to that of the built environment) resulted in a Declaration (reproduced below). This document, built by discussion among all participants, was intended to guide governments (at national, regional and municipal levels) to improve their ability to integrate concern for cultural heritage within existing emergency-planning and response infrastructures.

UNESCO has since been able to use this document in a number of important instances to assist countries to improve their state of risk-preparedness.

## The Kobe/Tokyo Declaration on Risk Preparedness for Cultural Heritage

Executive Summary
January 1997

On the second anniversary of the Great Hanshin-Awaji Earthquake, **The International Symposium on Risk Preparedness for Cultural Properties** was organized in Kobe (19 January 1997) and Tokyo (22-25 January 1997) by the Tokyo National University of the Arts, with support from the Government of Japan and its Agency for Cultural Affairs, Hyogo Prefecture Board of Education, Kobe City Board of Education and other related organizations. The Colloquium was organized in response to a proposal from the International **Inter-Agency Task Force on Risk Preparedness and Cultural Heritage** (including UNESCQ ICOMOS, ICOM, ICCROM, ICA and other organizations) in order to enhance international collaboration in the field and identify strategies and actions at national and international levels to minimize losses of, and damage to cultural heritage from catastrophe, of both natural and human origin.

A total of 726 individuals from 20 countries, including representatives of UNESCO, ICCROM, the Council of Europe, ICA, ICOM and ICOMOS, participated in the meetings in Kobe and Tokyo. Presentations and discussions examined issues in forums dealing with movable and immovable cultural heritage.

During the meeting, a working group was established to prepare a draft declaration based on the main ideas presented by invited speakers, and developed during subsequent debates and discussions. The draft Declaration was reviewed by meeting participants in a concluding plenary session. Suggestions made during the session (and in writing following the session) were integrated into a final text.

The Declaration is meant to provide a guiding strategic orientation for planning and decision-making involving both cultural heritage and disaster-preparedness administrators working to improve provisions in the field. It directs attention to the importance of integrating concern for cultural heritage within existing infrastructures for emergency planning and response, rather than creating parallel structures or programmes, and it identifies specific opportunities for such integration.

The Declaration acknowledges the many previous actions and initiatives in the field, upon which its recommendations are built. It affirms the importance of cultural heritage as an irreplaceable source of identity, continuity and memory in human society, deserving the same attention as human life, property and environmental values in disaster planning. It identifies needs and makes related recommendations in strengthening the framework for cooperation at international, regional, national and local levels, and in defining or improving programme initiatives in the areas of funding, emergency response, documentation and research, education and training and awareness (as defined in the "Blue Shield" Inter-Agency Task Force for Risk Preparedness and Cultural Heritage).

The Declaration is meant to provide a useful tool in guiding discussions for improvement in the field both in Japan, and at the International level.

## The Kobe/Tokyo Declaration on Risk Preparedness For Cultural Heritage

### Preamble

On the second anniversary of the Great Hanshin-Awaji Earthquake, **The International Symposium on Risk Preparedness for Cultural Properties** was organized in Kobe (January 19, 1997) and Tokyo (January 22-25, 1997) by the Tokyo National University of the Arts, with support from the Government of Japan and its Agency for Cultural Affairs, Hyogo Prefecture Board of Education, Kobe City Board of Education and other related organizations. The Colloquium was organized in response to a proposal from the IATF, the **International Inter-Agency Task Force on Risk Preparedness and Cultural Heritage** (including UNESCO, ICO-MOS, ICOM, ICCROM, ICA and other organizations) in order to enhance international collaboration in the field and identify strategies and actions at national and international levels to minimize losses of, and damage to cultural heritage from catastrophe, of both natural and human origin.

A total of 726 individuals from 20 countries, including representatives of UNESCO,ICCROM, the Council of Europe, ICA, ICOM and ICOMOS, participated in the meetings in Kobe and Tokyo.

The participants in the International Symposium on Risk Preparedness for Cultural Properties wish to express their appreciation and thanks to the Symposium organizers for providing conditions for fruitful exchange and for their courage in turning a national catastrophe into an experience of benefit to all.

The participants of the Kobe/Tokyo **International Symposium on Risk Preparedness for Cultural Properties,**

**Recognizing that the world's cultural heritage**

- combines moveable and immoveable forms, together composing an indivisible whole;
- is an essential source of identity, continuity and memory for individuals and communities, and is enriched by its diversity;
- is a non-renewable resource, whose conservation aims at retaining and revealing evidence of significant human endeavour and expression, and which falls within a broad concern for secure, healthy and meaningful life;
- is at risk, as is human life, from the threats posed by emergency situations;
- is shared by all, and is therefore the responsibility of all to protect.

**Affirming that measures to improve risk preparedness for cultural heritage involve:**

- **Strengthening the** framework for cooperation at international, regional, national and local levels through:
  - improving collaboration among citizens, non-governmental organizations, inter-governmental organizations and governments responsible for both disaster preparedness and cultural heritage;
  - working on integrated strategies for preparedness, response and recovery, before, during and after emergencies;
  - strengthening the place of cultural heritage within emergency infrastructures;
  - reducing risks to cultural heritage by natural agents or human action through systematic monitoring, regular maintenance, risk assessment and appropriate preventive care.

- Strengthening cultural heritage at risk activities and mechanisms through international initiatives such as the Blue Shield approach, and in particular, efforts to:
  - build support at the "grass-roots" (that is, national) level;
  - customize approaches to local circumstances through development of national models, appropriate in their contexts;
  - share experiences and learning through twinning of models, and pilot projects;
  - build a Risk Preparedness Programme focused in five main areas of need (funding, emergency response, documentation and research, education and training, awareness).'

**Considering the following needs identified during the Kobe/Tokyo Symposium discussions:**

- The need to strengthen the framework for cooperation at international, regional, national and local levels, by means which would:
  - Strengthen legal and administrative provisions for the protection of cultural heritage in disaster planning;
  - Improve coordination of risk preparedness activity in regions where risks are shared;
  - Establish in advance the principles and reference materials to be employed in decision making at the moment of emergency;
  - Increase sharing of technical capacity and resources among developed and developing countries;
  - Encourage appropriate use of conservation principles and standards in treating cultural heritage damaged in emergency situations;

- The need to strengthen and develop programme activities in the following Areas[2] at international, regional, national and local levels, by means which would:

**Funding**

  - Increase available resources for risk preparedness for cultural heritage, and improve mechanisms for sharing resources at international, regional, national and local levels.

1 Note: These programme areas reflect the framework established by the Inter-Agency Task Force (UNESCO-ICOM-ICOMOS-ICCROM-ICA-IFLA-IDNDR, the Council of Europe and other organizations at international and regional levels) within the 'Blue Shield Risk Preparedness Programme.' (See 'Blue Shield' under *Definitions* at end of the Declaration.)

2 As per footnote 1.

**Emergency Response**

- Increase the priority given to emergency response for cultural heritage at international, regional, national and local levels;
- Seek to meet public safety standards imposed by governments and municipalities by means which respect the values of cultural heritage.

**Documentation & Research**

- Enhance use of appropriate documentation systems to record cultural heritage prior to, during and following disaster;
- Strengthen research on methods, techniques and approaches of protecting cultural heritage and mitigating damage to it in emergency situations.

**Education & Training**

- Improve education and training for all groups involved with and concerned for cultural heritage at risk.

**Awareness**

- Increase awareness of the importance of integrating cultural heritage within risk preparedness and management policies, procedures and programmes.

**Therefore, [the participants] recommend the following strategies and actions be promoted by the Inter-Agency Task Force, and those organizations participating in it or sharing its objectives:**

- **In order to strengthen the framework for cooperation at international, regional, national and local levels:**
  - Encourage national governments to integrate concern for cultural heritage in disaster planning and related policies;
  - Encourage and support the creation of national coordinating committees, such as Blue Shield panels, composed of representatives of governmental, inter-governmental and non-governmental specialists and community organizations, with expertise in both cultural heritage and risk preparedness;
  - Promote applicable risk preparedness models at the national level;
  - Define and codify appropriate principles of risk preparedness for cultural heritage (moveable/immoveable), in the form of a Charter for Risk-Preparedness for Cultural Heritage, addressing issues of:

- Surveying/stabilizing/documenting conditions before and following disasters;
- Risk assessment, prevention and mitigation;
- Clarifying decision-making hierarchy;
- Promoting the retention and upgrading of existing structures;
- Promoting the flexible application of codes/standards and inventories.

– Strengthen the commitment of organizations participating in the IATF (and other relevant organizations) to supporting and implement IATF and related objectives for preventive action in the field;

– Enhance the development and appropriate use of expert networks;

– Strengthen support and encouragement for regional exchanges and collaborative initiatives in the field.

– Support and actively encourage the realization of the proposed international initiative, modelled after that of the Red Cross, in order to improve treatment and care available to damaged cultural heritage;

– Develop a comprehensive international framework of risk preparedness for cultural heritage by exploring integration of the curative approach, along the lines of the model developed in the Red Cross spirit as described above, and the Inter-Agency Task Force's preventive approach.

• **In order to strengthen and develop programme initiatives in the following areas[3] international, regional, national and local levels:**

**Funding**

– Increase resources for risk preparedness, in particular through establishing an International Trust Fund which could ensure effective distribution and replenishment of pooled funds;

– Ensure provision of risk preparedness measures for cultural heritage within development projects financed by multinational banking institutions;

– Ensure adequate levels of funding for research and training in the field;

3 As per footnote 1.

– Improve support for local efforts (through local non-governmental and/or non-profit organizations) to raise funds in relation to local needs.

**Emergency Response**

Ensure, in times of emergency, that protection efforts are extended to the widest possible range of cultural heritage;

— Ensure advance understanding of communication network flows, including line-of-command structures, and parallel fallback systems appropriate in planning for emergencies;

— Mobilize the media as a positive force in shaping public perceptions of the place of cultural heritage in risk preparedness, response and recovery;

— Inform States Parties to the 1954 Hague Convention and others, of the availability of the International Committee of the Blue Shield (ICBS), and of its member institutions and related organizations to advise on preventive and emergency response actions.

**Documentation and Research**

— Improve documentation on the nature of cultural heritage, in order to increase understanding of its qualities and protection needs in emergency situations;

— Create and strengthen well organized databases and information systems for risk assessment and early warning within disaster planning activity;

— Adopt a systematic approach to the documentation of damage to, or loss of cultural heritage in emergency situations;

— Develop an international research agenda in order to define research priorities in the field and to assign appropriate resources.

**Education and Training**

– Improve integration of appropriate education and training activities within existing educational systems (including university networks), institutional frameworks and relief efforts in both cultural heritage and disaster-preparedness fields;

– Promote continuing development, use and dissemination of practical training manuals, guidelines and other educational materials;

- Increase possibilities for systematic exchange of experiences and practices in risk preparedness for cultural heritage through interna-tional fora and other means of communication;
- Ensure coordinated approach to development of appropriate training initiatives by specialized regional and international training centers.

**Awareness**

- Increase sensitivity of all those involved (heritage specialists, site managers, policy and programme administrators, politicians, property owners, occupants and users, military personnel, volunteers, media and the public) to the benefits of, and requirements for effective risk preparedness for cultural heritage;
- Increase awareness of both psychological and physical factors in developing effective emergency response mechanisms;
- Increase commitment to approaches based on adequate maintenance and preventive care for moveable and immoveable cultural heritage;
- Increase appreciation and use of traditional techniques and practices of risk preparedness, assessment and mitigation.

**Definitions:**

**Cultural Heritage,** both moveable and immoveable, includes objects, specimens, structures, site or areas of historic architectural, artistic, social and/or scientific value.

The **Blue Shield** is the emblem of the UNESCO Convention for the Protection of Cultural Property in the Event of Armed Conflict (The Hague Convention of 1954).

Following the initiation of the International Inter-Agency Task Force (IATF) for Risk Preparedness for Cultural Heritage by UNESCO, ICCROM, ICOMOS, ICOM, ICA and other organizations in 1994, the Blue Shield is now being used for the Task Force's Risk Preparedness Programme, for the protection of moveable and immoveable cultural heritage threatened by disasters of human and natural origin.

In the particular area of emergency response, the Risk Preparedness Programme's discussion gave birth to the International Committee of the Blue Shield (ICBS)) in July 1996, coordinating the potential contributions of ICOMOS, ICOM, ICA, and IFLA at moments of disasters.

In general, in the context of the Blue Shield and this Declaration, "**Risk Preparedness**" is being used to signal equal concern for preparedness, response and recovery.

**Preventive care** involves efforts to mitigate loss of cultural heritage through policies and actions which improve the necessary conditions to prolong its life.

**Curative care** involves direct efforts to treat the material substance of cultural heritage in order to stabilize its physical condition and enhance its ability to express its cultural values.

**Acknowledgments**

The Kobe/Tokyo Declaration on Risk-Preparedness for Cultural Heritage and related discussions has built upon many important recent initiatives and accomplishments in the field. These include:

- The extraordinary recovery efforts undertaken by Japanese specialists, institutions and citizens following the Great Hanshin-Awaji Earthquake of January 17th 1995;
- The accomplishment of the International Decade for Natural Disaster Reduction (IDNDR 1990-2000) in strengthening coordination of humanitarian and disaster relief assistance, including the 1994 Yokohama IDNDR Strategy and Plan of action for a safer world in the 21st Century;
- Current efforts to strengthen the implementation of UNESCO's 1954 Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict (through review involving professional conservation bodies and others), the 1972 World Heritage Convention and the 1970 Convention on the Means of Prohibiting and Preventing Illicit Import, Export and Transfer of Ownership of Cultural Property Convention;
- Organization by UNESCO and the Red Cross of training activities for the military on the preventive measures of the Hague Convention for countries of the former USSR;
- Continuing efforts to implement the UNESCO Medium Term Plan to 2001, notably those measures promoting the mitigation of calamities to the cultural heritage and advancement of preventive measures;
- The initiative taken by ICOMOS in 1992 in organizing a first international round table of organizations and experts concerned with accelerating losses of cultural heritage in relation to natural disasters and armed conflicts, and which led to the establishment of the

Inter-Agency Task Force in 1994 to better coordinate international action in the field through annual meetings. Activities promoted by the Inter-Agency Task Force include:

- The development of national models of improved risk preparedness for cultural heritage, including those in place in Sri Lanka, Sweden and Canada;
- The distribution of pertinent ICOM/UNESCO guidelines, UNESCO recommendations, ICOMOS Doctrinal texts and the ICOMOS evaluation report of UNESCO's actions in the field (March 1995);
- The preparation of Guidelines for Risk Preparedness for World Cultural Heritage, with the support of the World Heritage Committee, begun in December 1995;
- The evolution of a strategy for the development and appropriate use of expert networks in times of emergency;
- The launching of the International Committee of the Blue Shield (ICBS) in July 1996 to provide a coordinating mechanism at the international level for emergency response;

– Meetings of various organizations at the regional level, including the SAARC (South Asian Association for Regional Cooperation) meeting of experts held in Colombo, Sri Lanka, in June 1995 on the conservation of cultural heritage and archival materials, the NATO-Partnership for Peace conference held in Krakow, Poland, in June 1996 on the protection of cultural heritage in times of disasters and armed conflicts, and various meetings of the Council of Europe on the protection of architectural and cultural heritage against pollution, earthquakes and unlawful acts;

– The implementation and coordination of risk-preparedness response and recovery operations and initiatives at the national level, including the National Task Force on Emergency Response launched in the USA in November 1994 by FEMA (Federal Emergency Management Agency, the NIC (National Institute for the Conservation of Cultural Property) and the GCI (Getty Conservation Institute);

_ The efforts of Prof. Hirayama of the Tokyo National University of the Arts (Professor Emeritus), UNESCO's Goodwill Ambassador, to implement an international mechanism to provide curative care for cultural heritage damaged by catastrophe, conflict or neglect, in the spirit of the Red Cross approach, based on his experiences in salvaging significant Silk Road cultural heritage across Asia.

# THE BLUE SHIELD MOVEMENT TO IMPROVE RISK PREPAREDNESS FOR CULTURAL HERITAGE

Inter-Agency Task Force discussions have provoked many parallel exchanges at the international level. Two significant meetings took place in Canada and Japan in 1996 and 1997.

- In September 1996, in Quebec City, some seventy Canadian and international professionals involved with cultural heritage and with risk-preparedness discussed how to improve conditions for cultural heritage at risk, during an ICOMOS Canada 'Summit Meeting' on the subject. Their discussions resulted in the *Declaration of Quebec* (see Appendix A), intended to assist Canadian decision-makers and professionals in improving practices and possibilities.
- In January 1997, on the second anniversary of the Great Hanshin-Awaji Earthquake in Kobe, approximately 150 professionals and 550 observers participated in meetings in Kobe and in Tokyo to discuss how to improve conditions for cultural heritage at risk, both in Japan and internationally. The resulting *Kobe-Tokyo Declaration for Cultural Heritage at Risk* (see Appendix B) focused on improved integration of preparedness measures for cultural heritage in existing risk-preparedness infrastructures as the key to increased effectiveness.

Other initiatives have also contributed ideas and useful debates to the growing body of thought in the field.

- At the regional level, at the meeting in Sri Lanka in June 1995 of the Ministers of Culture of the countries of the South Asian Association for Regional Cooperation (SAARC), government officials committed themselves to improved cooperation in the field.
- At the regional level, cultural heritage and civil defense professionals from 20 countries in former Eastern Europe met in Skopje (Former Yugoslav Republic of Macedonia) in September 1997 to discuss risk-preparedness; supported principally by the Getty Conservation Institute and US-ICOMOS, the meeting provided an opportunity for responsible officials in participating countries to upgrade their ability to prepare for disasters within their own particular contexts.
- At the national level, a Task Force set up in December 1995 in the USA by the Federal Emergency Management Agency (FEMA), the Getty Conservation Institute (GO) and the National Institute for Conservation of Cultural Property (NIC) has been able to develop a number of practices to aid cultural institutions and others to improve their preparedness.

- At the local level, a May 1997 seminar in Montreal, involving more than 100 representatives of 29 municipalities and related heritage groups and cultural institutions, initiated elaboration of a coordinated local-action plan to improve readiness.

These meetings have also served to highlight existing useful models of preparedness and response: the emergency plan developed by Canada's National Archive following water damage within their building; the preparedness plan developed by Andre van der Goes, Site Curator for Amerongen Castle in the Netherlands; and the national scheme of emergency-preparedness for cultural heritage put in place in Switzerland in the mid 1970s, to mention but a few.

These discussions have also contributed significantly to evolving philosophies in the conservation field itself, and suggested new directions for conservation practice. Essentially, concern for risk preparedness moves attention from the curative to the preventive. This primary concern for the conditions within which important cultural heritage exists — not just the treatments required to sustain life and meaning — has long been a priority in the museum and archaeological conservation world. However, the major doctrinal texts of the built heritage conservation field, including the Venice Charter, have focused primarily on intervention — on how to treat the monument or site 'appropriately' at a moment in time in order to improve its state of repair or recover its meaning. While the Venice Charter and related documents refer to the importance of 'maintenance' — in itself a critically important form of preventive conservation — these references are often unsupported by demonstrations of the consequences of neglect or deferred maintenance. A cultural-heritage-at-risk approach maintains that cultural heritage is always at risk, both from cataclysmic forces and form those of daily attrition and decay; it therefore provides a comprehensive planning framework linking 'maintenance' to disaster preparedness. While adoption of such a framework increaseingly facilitates investment in risk reduction and advance preparations, more importantly it could reduce the number of curative 'conservation' episodes that will be necessary in the life of a heritage property.

Perhaps the most tangible benefit of the Inter Agency Task Force meetings held since 1992 was the creation in July 1996 of the **International Committee of the Blue Shield.** Conceived as an analogue to the International Committee of the Red Cross, (set up to provide emergency relief in the context of the Geneva Convention), the ICBS provides an integrated emergency response mechanism linking ICOMOS, ICOM, ICA and IFLA. It has been envisioned that in times of emergency, UNESCO will call upon the ICBS to ensure a coordinated response to needs, ensuring integrated treatment of library, museum and archive collections, and built heritage. The Heads of Agreement constituting the understanding of the four NGO s is reproduced below. The first actions of the ICBS involved offering services to the Prime Minister of Canada, Jean Chretien, immediately following the devastation of the Saguenay floods of late July 1996.

## *The International Committee of the Blue shield (ICBS)*
## *Draft Heads of Agreement*

I. ICA, ICOM, ICOMOS and IFLA (the Constituent Organizations) agree to establish the ICBS. Other international organizations may be invited by the Constituent Organizations to join or to participate in the work of the Committee.

II. The objectives of the Committee shall be as follows:

a) to provide advice for the protection of cultural heritage in the case of identified threats or of emergencies created by natural or human causes, particularly in the case of armed conflict;

b) to facilitate international response to threats or emergencies through co-operation between the participating organizations and national organizations;

c) to act in an advisory capacity in cases arising under the Hague Convention for the Protection of Cultural Property in the Event or Armed Conflict 1954;

d) to encourage safeguarding and respect for cultural property and particularly to promote higher standards of risk preparedness;

e) to consult and co-operate with other bodies with appropriate expertise or interest including (but not excluding others): UNESCO, ICCROM, International Committee of the Red Cross (ICRC);

f) to facilitate professional action at national or regional level to prevent, control and recover from disasters.

III. The members of the Committee shall be the chief executive of each organization participating or his or her nominated substitute.

IV. The Committee shall hold not less than one general meeting annually. In addition it shall meet in emergency session at the request of any of the participating organizations or of the bodies in 2 e) above.

V. The participating organizations shall share the administration and the administrative costs according to a separate agreement.

VI. Rules of procedure of the Committee will be developed in due course and be the subject of a separate agreement.

4 April 1996

# ICOMOS PRINCIPLES FOR THE RECORDING OF MONUMENTS, GROUPS OF BUILDINGS AND SITES

Approved by the ICOMOS General Assembly in Sofia, Bulgaria, in October 1996, this document is one of the more recent additions to the large family of doctrinal texts initiated and maintained by ICOMOS. Within the overall framework established by the Venice Charter of 1964, ICOMOS subsequently encouraged both its national committees to develop national documents reflecting principles appropriate in the national context, and its international committees to develop guideline texts appropriate in their particular areas of application. The ICOMOS Recording and Documentation Principles have their origins within both national and international ICOMOS Committees; initiated by ICOMOS UK , the document also eventually involved the ICOMOS International Committee on Photogrammetry (Working Group on Recording) in review. An international expert meeting held at ICCROM in March 1995 resulted in the document ultimately being approved by the ICOMOS General Assembly in 1996.

As the *Risk-Preparedness Manual* demonstrates, documentation is a continuing concern in risk-preparedness planning. The following document represents `best practice' advice around which consensus was built within the international conservation community, and is meant to guide individuals and agencies to ensure their ability to integrate sound recording and documentation practices within risk-preparedness planning.

## Principles for the Recording of Monuments, Groups of Buildings and Sites

(Text ratified by the 11th ICOMOS General Assembly,
held in Sofia, Bulgaria, from 5 to 9 October 1996)

As the cultural heritage is a unique expression of human achievement; and

as this cultural heritage is continuously at risk; and

as recording is one of the principal ways available to give meaning, understanding, definition and recognition of the values of the cultural heritage; and

as the responsibility for conserving and maintaining the cultural heritage rests not only with the owners but also with conservation specialists and the professionals, managers, politicians and administrators working at all levels of government, and with the public; and

as Article 16 of the Charter of Venice requires, it is essential that responsible organisations and individuals record the nature of the cultural heritage.

The purpose of this document is therefore to set out the principal reasons, responsibilities, planning measures, contents, management and sharing considerations for the recording of the cultural heritage.

Definitions of words used in this document:

*Cultural Heritage* refers to monuments, groups of buildings and sites of heritage value, constituting the historic or built environment.

*Recording* is the capture of information which describes the physical configuration, condition and use of monuments, groups of buildings and sites, at points in time, and it is an essential part of the conservation process.

*Records* of monuments, groups of buildings and sites may include tangible as well as intangible evidence, and constitute a part of the documentation that can contribute to an understanding of the heritage and its related values.

## The reasons for recording

1. The recording of the cultural heritage is essential:

   a) to acquire knowledge in order to advance the understanding of cultural heritage, its values and its evolution;

   b) to promote the interest and involvement of the people in the preservation of the heritage through the dissemination of recorded information;

   c) to permit informed management and control of construction works and of all change to the cultural heritage;

   d) to ensure that the maintenance and conservation of the heritage is sensitive to its physical form, its materials, construction, and its historical and cultural significance.

2. Recording should be undertaken to an appropriate level of detail in order to:

   a) provide information for the process of identification, understanding, interpretation and presentation of the heritage, and to promote the involvement of the public;

   b) provide a permanent record of all monuments, groups of buildings and sites that are to be destroyed or altered in any way, or where at risk from natural events or human activities;

   c) provide information for administrators and planners at national, regional or local levels to make sensitive planning and development control policies and decisions;

d) provide information upon which appropriate and sustainable use may be identified, and the effective research, management, maintenance programmes and construction works may be planned.

3. Recording of the cultural heritage should be seen as a priority, and should be undertaken especially:

   a) when compiling a national, regional, or local inventory;

   b) as a fully integrated part of research and conservation activity;

   c) before, during and after any works of repair, alteration, or other intervention, and when evidence of its history is revealed during such works;

   d) when total or partial demolition, destruction, abandonment or relocation is contemplated, or where the heritage is at risk of damage from human or natural external forces;

   e) during or following accidental or unforeseen disturbance which damages the cultural heritage;

   f) when change of use or responsibility for management or control occurs.

**Responsibility for Recording**

1. The commitment at the national level to conserve the heritage requires an equal commitment towards the recording process.

2. The complexity of the recording and interpretation processes requires the deployment of individuals with adequate skill, knowledge and awareness for the associated tasks. It may be necessary to initiate training programmes to achieve this.

3. Typically the recording process may involve skilled individuals working in collaboration, such as specialist heritage recorders, surveyors, conservators, architects, engineers, researchers, architectural historians, archaeologists above and below ground, and other specialist advisors.

4. All managers of cultural heritage are responsible for ensuring the adequate recording, quality and updating of the records.

**Planning for Recording**

1. Before new records are prepared, existing sources of information should be found and examined for their adequacy.

   a) The type of records containing such information should be searched for in surveys, drawings, photographs, published and unpublished accounts and descriptions, and related documents pertaining to the origins and history of the building, group of buildings or site. It is important to search out recent as well as old records;

b) Existing records should be searched for in locations such as national and local public archives, in professional, institutional or private archives, inventories and collections, in libraries or museums;

c) Records should be searched for through consultation with individuals and organisations who have owned, occupied, recorded, constructed, conserved, or carried out research into or who have knowledge of the building, group of buildings or site.

2. Arising out of the analysis above, selection of the appropriate scope, level and methods of recording requires that:

a) The methods of recording and type of documentation produced should be appropriate to the nature of the heritage, the purposes of the record, the cultural context, and the funding or other resources available. Limitations of such resources may require a phased approach to recording. Such methods might include written descriptions and analyses, photographs (aerial or terrestrial), rectified photography, photogrammetry, geophysical survey, maps, measured plans, drawings and sketches, replicas or other traditional and modern technologies;

b) Recording methodologies should, wherever possible, use non-intrusive techniques and should not cause damage to the object being recorded;

c) The rationale for the intended scope and the recording method should be clearly stated;

d) The materials used for compiling the finished record must be archivally stable.

## Content of Records

1. Any record should be identified by:

a) the name of the building, group of buildings or site;

b) a unique reference number;

c) the date of compilation of the record;

d) the name of the recording organisation;

e) cross-references to related building records and reports, photographic, graphic, textual or bibliographic documentation, archaeological and environmental records.

2. The location and extent of the monument, group of buildings or site must be given accurately; this may be achieved by description, maps, plans or aerial photographs. In rural areas a map reference or triangulation to known points may be the only methods available. In urban areas an address or street reference may be sufficient.

3. New records should note the sources of all information not obtained directly from the monument, group of buildings or site itself.

4. Records should include some or all of the following information:
   a) the type, form and dimensions of the building, monument or site;
   b) the interior and exterior characteristics, as appropriate, of the monument, group of buildings or site;
   c) the nature, quality, cultural, artistic and scientific significance of the heritage and its components and the cultural, artistic and scientific significance of:
      — the materials, constituent parts and construction, decoration, ornament or inscriptions,
      — services, fittings and machinery,
      — ancillary structures, the gardens, landscape and the cultural, topographical and natural features of the site;
   d) the traditional and modern technology and skills used in construction and maintenance;
   e) evidence to establish the date of origin, authorship, ownership, the original design, extent, use and decoration;
   f) evidence to establish the subsequent history of its uses, associated events, structural or decorative alterations, and the impact of human or natural external forces;
   g) the history of management, maintenance and repairs;
   h) representative elements or samples of construction or site materials;
   i) an assessment of the current condition of the heritage;
   j) an assessment of the visual and functional relationship between the heritage and its setting;
   k) an assessment of the conflicts and risks from human or natural causes, and from environmental pollution or adjacent land uses.
5. In considering the different reasons for recording (see Section 1.2 above) different levels of detail will be required. All the above information, even if briefly stated, provides important data for local planning and building control and management. Information in greater detail is generally required for the site or building owner's, manager's or user's purposes for conservation, maintenance and use.

## Management, Dissemination and Sharing of Records

1. The original records should be preserved in a safe archive, and the archive's environment must ensure permanence of the information and freedom from decay to recognised international standards.
2. A complete back-up copy of such records should be stored in a separate safe location.

3. Copies of such records should be accessible to the statutory authorities, to concerned professionals and to the public, where appropriate, for the purposes of research, development controls and other administrative and legal processes.
4. Updated records should be readily available, if possible on the site, for the purposes of research on the heritage, management, maintenance and disaster relief.
5. The format of the records should be standardised, and records should be indexed wherever possible to facilitate the exchange and retrieval of information at a local, national or international level.
6. The effective assembly, management and distribution of recorded information requires, wherever possible, the understanding and the appropriate use of up-to-date information technology.
7. The location of the records should be made public.
8. A report of the main results of any recording should be disseminated and published, when appropriate.

# DECLARATION OF ASSISI

## 1. Introduction

1.1 Experts from all over the world met in Assisi on 27-28 February 1998 for a workshop organized by the ICOMOS Scientific Committee for the Analysis and Restoration of Structures of Architectural Heritage.

1.2 The experts express their solidarity with the local population, and with the public and religious authorities of Assisi and the Umbria and Marche Regions, in the resolute action that they have taken to repair the damage caused by the series of earthquakes in the autumn of 1997. They also remember the colleagues who lost their lives in attempting safeguard measures during the earthquake.

1.3 The experts express their support to the emergency measures taken in view of mitigating the damage caused to the Basilica of San Francesco of Assisi.

1.4 The experts express the wish that lessons be drawn from the catastrophe and evaluated critically in the light of the specific characteristics of each region. This should encourage the development of appropriate risk-preparedness policies in all countries, in order to prevent and/or limit the effects of natural disasters. To implement such policies, relevant guidelines should be produced according to good practices.

1.5 In complimenting the authorities for the successful workshop, the participants expressed their gratitude to the Franciscan Community of the Holy Convent of St Francis of Assisi for the generous invitation to welcome next year a similar workshop.

## 2. Importance of Risk-Preparedness Policy

2.1 Coordinated maintenance should be a priority for the conservation of the architectural heritage.

2.2 When natural risks endanger monuments, sites or heritage landscapes, preventive actions represent the best policy for the safeguard of cultural heritage.

2.3 Risk preparedness provides indispensable strategy and organization for the management of emergency situations and the prevention and limitation of damage.

2.4 Risk preparedness in respect of cultural heritage should be considered within the framework of the general policies developed to protect people, infrastructures, and properties.

2.5 Such an organization requires the involvement of all the authorities concerned, starting at the local level, in dialogue and collaboration with voluntary organizations.

2.6 Resources should be allocated to this objective, the prevention of causes of damage being in general more economical than repair.

**3. Three Moments to be considered: before, during and after disaster**.

3.1.1 Risk assessment should be organized on the basis of a general programme, starting with preliminary investigations, including relevant research, systematic and comprehensive documentation, and progressively analysing the complexity of buildings.

3.1.2 Risk assessment requires expertise and time, and should be allocated appropriate funding.

3.1.3 The different types of risks and appropriate responses should be identified and analysed, specific to each location: fire, floods, earthquakes, storms, landslides, etc.

3.1.4 Risk assessment should aim at the identification of the relevant safety levels and the potential risks according to the specific characteristics of each region and locality, collected systematically and presented in the form of a 'risk map'.

3.1.5 A scale of priorities should be established related to the cultural values of the properties, their vulnerability, and the potential risk.

3.1.6 Coordinated management plans, including practical operational guidelines, should be developed as essential tools for protection, in order to reduce risks and for advance warning.

3.1.7 Risk assessment and the development of relevant preparedness measures form a crucial phase, when the strategy for emergency response has to be decided and developed in detail.

***3.2 Emergency response**:*

3.2.1 The response plan must be available and immediately implemented by all agents.

3.2.2 Mitigation measures should be a compromise based on a balanced judgement: on the one hand, avoiding alterations in the original conception, technique and technology, and, on the other hand, providing the required safety level. The measures should be applied only after having clearly identified the risk levels and the most vulnerable zones. It is necessary always to pay particular attention to the protection of people involved in the operations.

3.2.3 Priority should be given to compatible and reversible measures.

***3.3 Restoration and reconstruction**:*

3.3.1 The works should comply with the generally accepted conservation principles.

3.3.2 In case of provisional relocation of inhabitants during emergency and repair periods, the occupied areas should be submitted to a physical planning with due respect to the significance of heritage landscape and environment.

## 4. Training and Public Awareness

4.1 Risk assessment and emergency response require people with adequate training and skills.

4.2 Site managers should be aware of, and adequately trained to effectively implement risk preparedness measures and operational guidelines.

4.3 Property owners and the general public should be made aware of the necessity of careful frequentation and of preventive maintenance of historic structures.

4.4 Decision-makers should be made aware of the importance of risk preparedness and implement relevant policies.

## 5. References

The present declaration is based on recommendations and conclusions of several existing documents, such as:

5.1 Council of Europe Recommendation of 1993 "On the protection of the architectural heritage against natural disasters," and especially the recommendation of the 1988 Skopje Workshop.

5.2 UNESCO Conventions and Recommendations.

5.3 ICCROM training programmes.

5.4 Eurocode no. 8 "Design provisions for earthquake resistance of structures."

5.5 Reports of the round-tables organized by ICOMOS since 1993 for the Inter-Agency Task Force.

5.6 The "International Committee of the Blue Shield" initiative developed jointly by ICOM (International Council of Museums), ICOMOS (International Council on Monuments and Sites), ICA (International Council on Archives), and IFLA (International Federation of Library Associations and Institutions) with the support of UNESCO and ICCROM.