



Proceedings of the International Conference
Preventive and Planned Conservation
Monza, Mantova - 5-9 May 2014

4

Metodi e strumenti per la prevenzione e la manutenzione



A cura di **Stefano Della Torre**
Curatela editoriale **Maria Paola Borgarino**



NARDINI EDITORE

Proceedings of the International Conference
Preventive and Planned Conservation
Monza, Mantova - 5-9 May 2014



**POLITECNICO
DI MILANO**



Metodi e strumenti per la prevenzione e la manutenzione

Proceedings of the International Conference
Preventive and Planned Conservation
Monza, Mantova - 5-9 May 2014

Comitato scientifico

Carlo Blasi, *Università di Parma, Italy*
Federico Bucci, *Politecnico di Milano, Italy*
Fausto Cardoso Martinez, *University of Cuenca, Ecuador*
Angelo Ciribini, *Università di Brescia, Italy*
Nigel Dann, *University of the West of England, United Kingdom*
Stefano Della Torre, *Politecnico di Milano, Italy*
Sasa Dobričić, *University of Nova Gorica, Slovenia*
Xavier Greffe, *Université Paris 1 Panthéon-Sorbonne, France*
Massimo Montella, *Università di Macerata, Italy*
Elena Mussinelli, *Politecnico di Milano, Italy*
Christian Ost, *ICHEC Brussels Management School, Belgium*
Ana Pereira Roders, *University of Eindhoven, Holland*
Pietro Petrarola, *Eupolis Lombardia, Italy*
Mario Santana Quintero, *Carleton University, Canada*
Koenraad Van Balen, *UNESCO Chair for PRECOMOS, KU Leuven, Belgium*
Minja Yang, *RLICC, KU Leuven, Belgium*
Rossella Moioli, *Distretto Culturale Monza e Brianza, Italy (coordinamento)*

Segreteria scientifica del convegno:

Maria Paola Borgarino, Stefania Bossi
Politecnico di Milano, Dipartimento ABC - Architecture, Built Environment and Construction Engineering

Atti a cura di Stefano Della Torre

Curatela editoriale: Maria Paola Borgarino
Impaginazione e collaborazione alla revisione dei testi: Cristina Boniotti

Politecnico di Milano - Dipartimento ABC - Architecture, Built Environment and Construction Engineering
Fondazione Cariplo, progetto Distretti Culturali
Distretto Culturale Evoluto di Monza e Brianza - Provincia di Monza e della Brianza
Distretto Culturale Le Regge dei Gonzaga

Con il patrocinio della



Regione Lombardia

@ 2014 Politecnico di Milano e Nardini Editore
Tutti i diritti sono riservati

Copertina Ennio Bazzoni

Stampato per Nardini Editore

Le immagini contenute in questo volume sono fornite dagli autori al Politecnico di Milano e all'editore sotto la propria esclusiva responsabilità e sono state utilizzate per scopo didattico e per divulgazione. L'editore è disponibile a riconoscere la paternità delle immagini ad altri che la dimostrino, e a citare gli aventi diritto nelle successive edizioni.



Proceedings of the International Conference
Preventive and Planned Conservation
Monza, Mantova - 5-9 May 2014

4

Metodi e strumenti per la prevenzione e la manutenzione



A cura di **Stefano Della Torre**
Curatela editoriale **Maria Paola Borgarino**

Indice

PLANNED AND PREVENTATIVE CONSERVATION & ENGLAND: EXPERIENCES, OPPORTUNITIES AND REQUIREMENTS Nigel Dann	pag. 1
LEARNING TO GIVE CLIENTS WHAT THEY DON'T WANT. CONSERVATION EDUCATION AND POST-TREATMENT MONITORING AND MAINTENANCE Francesca Piqué, Julian James	” 11
FROM A WORKING DEFINITION OF PREVENTIVE AND PLANNED CONSERVATION TOWARDS THE INNOVATIVE SERVICES OF MONUMENTENWACHT VLAANDEREN Aziliz Vandesande, Elisabeth Michiels, Koen Van Balen	” 25
THE ROMAN WALLS OF LUGO MAINTENANCE PLAN: A TOOL FOR PREVENTIVE AND PLANNED CONSERVATION OF A UNESCO SITE Giorgio Faraci	” 35
PREVENTIVE CONSERVATION VERSUS RISK MANAGEMENT. APPLYING AN INNOVATIVE METHODOLOGY DEVELOPED BY ICCROM, CCI AND RCE Carla Pianese, Giorgia Bonesso	” 47
TOWARDS A PPC FOR AN HISTORICAL AQUEDUCT. Anna Decri, Cristina Pastor	” 57
LA PRATICA DEI PROCESSI DI CURA NELLA CONSERVAZIONE DEGLI EDIFICI ECCLESIASTICI Paolo Gasparoli, Chiara Livraghi, Fabiana Pianezze, Matteo Scaltritti	” 67
SURVEY AND ASSESSMENT OF A MASONRY CHIMNEY IN MILAN Giulio Mirabella Roberti, Andrea Castiglioni	” 79
ALCUNE CONSIDERAZIONI SUL CONTROLLO DELLE OPERAZIONI DI RESTAURO E SULLA CONSERVAZIONE PROGRAMMATA DEI DIPINTI MURALI Paolo Bensi	” 91
PRESERVATION STRATEGY OF HISTORIC TOWERS BASED ON CONTINUOUS DYNAMIC MONITORING: A CASE STUDY Antonella Saisi, Carmelo Gentile	” 101
UN PIANO DI CONSERVAZIONE PREVENTIVA PER LA REGGIA DI VENARIA: DAL CASO DI STUDIO AL PROGETTO PER IL SISTEMA DELLE RESIDENZE SABAUDE Stefania De Blasi, Marco Nervo	” 113

segue

segue **Indice**

THE IMPORTANCE OF RISK PREVENTION FOR THE PROTECTION OF BUILT CULTURAL HERITAGE: DRAFTING DISASTER RISK MANAGEMENT PLAN FOR CIMITERO MUNUMENTALE DI STAGLIENO (GENOVA) AND THE CULTURAL LANDSCAPE OF PORTOVENERE, CINQUE TERRE AND THE ISLANDS Barbara Caranza, Paola Mussini	” 127
PPC AT LAVELLO CONVENT: TOWARDS A SUSTAINABLE CONSERVATION PLAN AFTER THE RESTORATION Bruno Daniotti, Silvia Erba, Rossella Moioli, Elisabetta Rosina, Antonio Sansonetti	” 137
PIANI DI CONSERVAZIONE DEL PATRIMONIO STORICO ARCHITETTONICO: OPPORTUNITÀ E CRITICITÀ ATTRAVERSO ALCUNI CASI STUDIO Stefania Bossi	” 151
CONSERVARE, MANTENERE E VALORIZZARE NELLA DIOCESI DI MILANO: STATO DELL'ARTE E POSSIBILI SVILUPPI Laura Lazzaroni	” 161
LA CONSERVAZIONE DEL PATRIMONIO ECCLESIASTICO DIFFUSO IN ITALIA Silvia Salvini, Valentina Cinieri	” 169
L'ESPERIENZA DEI CASTELLI DELLA VALTENESI COME VOLANO PER LA PROMOZIONE DELLA CONSERVAZIONE PROGRAMMATA Barbara Scala	” 179
MONITORING OF THE TEMPERATURE-MOISTURE REGIME OF ST. MARTIN CATHEDRAL IN BRATISLAVA L. Kubičár, J. Hudec, D. Fidiriková, V. Štofanič, P. Dieška	” 191
PIANIFICAZIONE DEI CONTROLLI ED AZIONE PREVENTIVA NELLO SVILUPPO DEL NUOVO SISTEMA DI VALUTAZIONE GBC HISTORIC BUILDING™ Marco Zuppiroli	” 203
ASSESSING TIES OF “DUOMO DI MILANO” WITHIN THE CONSERVATION STRATEGY Mira Vasic, Dario Coronelli, Carlo Poggi	” 213
THEORETICAL CONSTRUCT, METHOD AND WORKING TOOL OF THE “PREVENTIVE RESTORATION”. THE ELECTRONIC BOOK FOR THE PRE-ARRANGED MAINTENANCE OF ARCHITECTURAL HERITAGE Gaspere Massimo Ventimiglia	” 221

FROM A WORKING DEFINITION OF PREVENTIVE AND PLANNED CONSERVATION TOWARDS THE INNOVATIVE SERVICES OF MONUMENTENWACHT VLAANDEREN

Aziliz Vandesande*, Elisabeth Michiels**, Koen Van Balen*

* *Katholieke Universiteit Leuven, Faculty of Engineering Science, Raymond Lemaire International Centre for Conservation*

** *Monumentenwacht Vlaanderen*

Abstract

This paper addresses several important issues to understand preventive and planned conservation (PPC) today, ranging from theoretical to practical implications. In line with this, a working definition of PPC and the approach of Monumentenwacht Vlaanderen in implementing the PPC approach are presented.

Next, the researchers introduce a problem statement related to a new policy tendency that stresses sustainable development as a central goal and the diminishing public financial resources directly allocated to the built heritage. In response, the researchers introduce the innovative service of Monumentenwacht Vlaanderen, i.e. Maintenance Cost Analysis.

The foundation of the concept PPC can be linked to the emerging modern historical consciousness at the end of the eighteenth century. This new consciousness brought an end to the traditional link with the past and produced the conditions necessary for a more objective, scientific approach to the past. In this context, John Ruskin (1819-1900) is considered the first to express a full awareness of the consequences. His often quoted essay “The Lamp of Memory” (1885) displays a strong belief in continuity over generations, which in turn inspired William Morris (1834-1896), the founder of the Society for the Protection of Ancient Buildings (SPAB), in his philosophy of repair and maintenance and to demand building owners to “stave off decay by daily care” (Morris, 1877).

It is ordinarily accepted that before this paradigm shift “old” buildings were in rule rebuilt according to the prevailing style, without any restraint for what today is considered historical value. However, this idea should at the very least be put in perspective, as prior examples of PPC principles can be traced (Denslagen, 1987). It is likely that systematic historiographical research

conducted on PPC can bring further insight on whether its basic rationality of maintenance has a longer and more founded tradition than currently assumed.

Nevertheless, the impact of Ruskin and the developments in his aftermath on this particular topic in heritage conservation cannot be disputed. The researchers wish to mention in this context Raymond Lemaire (1921-1997), founder of the Raymond Lemaire International Centre (RLICC) at the University of Leuven, official reporter at the Second International Congress of Architects and Specialists of Historic Buildings in Venice (1964) and co-author with Piero Gazzola (1908-1979) and Roberto Pane (1897-1987) of the final Venice Charter. During a radio interview in 1975, on the occasion of the European Architectural Heritage Year, he stated that “we are too easily thinking today that always an old building must be restored. That is not quite so [...]. Buildings are being restored that do not need restoration at all [...]. Let us first and foremost conserve buildings. And to do that, we need maintenance”. (Fonds Raymond Lemaire 1921-1997)

However, it was only during the last 3 decades that PPC became more prominently present on international and European scale and of interest to academic research. To name some: Mills 1994; Feilden 1994; Dann and Wood 2004; Mansfield 2008. Next to the qualitative case-based research that has been done by University of the West of England in context of Maintain our Heritage (Dann, 2013) a large part of the research focuses on the concept and rationale of PPC. Thereby, the main external benefits of this approach are considered the cost-effectiveness for private owners and managers of built heritage (Forster, Kayan, 2009), involvement of local communities (Della Torre, 2014 - Thematic week presentation), contribution to resource protection and environmental enhancement (Van Balen, Vandesande, 2013), prolongation of the physical service life of buildings and building parts (Thomson, van der Flier, 2009), waste-avoidance activity (Cassar, 2009) and preserving embodied energy (Power, 2010).

PPC working definition

As can be observed from the development of interest in PPC, it has become a very broad and much described topic. In order to produce a consistent and clear paper the researchers opted to put forth for a working definition of PPC. Herewith it is important to note that the functional delineation of PPC is more extensive and layered than just scheduled maintenance.

Within this research the concept PPC refers to processes that are:

- Preventative: The notion preventative refers to the most basic “Ruskinian” characteristic of PPC, its inherent requirement to limit deterioration, avoid consequential damage and the need for potentially expensive and disruptive repair works. This approach has a long-standing tradition in the field of museology and archaeology, which however contrasts the field of built heritage as optimising the environmental conditions in which the object is preserved cannot be attained.
- Primed: The notion primed is introduced in as a result of the methodological model, the Preventive Conservation Cycle, which is applied as the scientific background for PPC. Based on the Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage (ICOMOS 2003), the model entails a never-ending loop that consists of four phases in the PPC process: analysis, diagnosis, therapy and control (Van Balen, 2011). The different phases correspond respectively to the search for significant data and information, individualization of the causes of damage and decay, choice of the remedial measures and control of efficient interventions.
- Planned: The notion planned stresses that PCC is an integral strategy for built heritage based on a long-term vision for every stage of the conservation and management process. This implies a set of attitudes and policies more than single actions (Della Torre, 2013) and a systemic approach to decision making, giving the utmost importance to involvement of local communities.

Following this conceptual definition, in practice PPC consists of three classes of action which are based on the three classes of prevention defined in medicine (Gordon, 1983; Van Balen, 2013).

- Primary: correct (re)-use and avoid the causes of unwanted effect. Direct interventions that encompass adaptation to new use are planned, taking into account durability and property management.
- Secondary: early detection of the symptoms of the unwanted effects by means of monitoring. Systematic condition surveys detect the need for immediate repairs, provide a basis for detailed planning and identify the behaviour of historic structures on the long-term.
- Tertiary: avoiding further spread of the unwanted effect and correction of defects to prevent major consequential damage. Maintenance and necessary interventions are qualitative through use of material, skills of workers and planning of work.

This definition is developed and adopted by the UNESCO Chair on Preventive Conservation, Monitoring and Maintenance of Monuments and Sites (PRECOM³OS) which was established in 2009 at the RLICC in collaboration with Monumentenwacht Vlaanderen and the University of Cuenca (Ecuador).

PPC in practice

Parallel to the international development of PPC as a research topic, there are promising examples that demonstrate the viability of this approach. Herewith reference is made to the wide-area project “Distretti Culturali” established by the Fondazione Cariplo in collaboration with the Politecnico di Milano in the Lombardy Region and heritage maintenance campaigns implemented in Susudel, the graveyard in the Municipality Oña and the city quarter San Roque in Cuenca by the Faculty of Architecture of the Universidad de Cuenca.

Within this context special notice should be made of Monumentenwacht, a well-established, experienced and highly professional organisation that embodies PPC in the real world. It is a organisation that supports private and public built heritage owners and managers in the preservation of their properties through a system of regular systematic maintenance. The Netherlands and Flanders play a pioneering role as a country and region where Monumentenwacht is successfully realised, respectively since 1973 and in Flanders since 1991 (Stulens, 2006). Other organisations that follow this model have been implemented in Europe, i.e. Maintain Our Heritage in the UK, Bygningsbevaring in Denmark and Denkmalwacht in Germany. More recently there are other establishing attempts, i.e. Múemlékőr in Hungary and the Traditional Buildings Health Check Scheme in Scotland.

Problem statement

Despite the growing research interest and promising examples, the researchers observed a key obstruction for implementing PPC, both on local and on an international level.

It can be stated that while some of the maintenance techniques seem to be documented and the benefits are known, there is a problem with embedding the strategy with full understanding of long-term effects which unfortunately results too often in postponed interventions and costly restorations. It has been put forth that “very little has been written specifically dealing with systematic maintenance of or for building conservation” and that “there is no well-

established academic study or research to ascertain why maintenance is not widely practiced, disseminated and developed” (i.a. Worthing et al. 2002: 292; Dann and Cantell 2005: 42; Forster and Kayan 2009: 211). This problem was one of the topics discussed during the 2013 Thematic Week organised by the Raymond Lemaire International Centre for Conservation at University of Leuven from 23-25 January 2013 which examined the ongoing research and polemics on preventive conservation. Among the different professionals and academics the growing need to quantifying the impact of a PPC strategy was frequently cited as a valid response. This corresponds with the idea that having local governments approve such programs for built heritage is no longer solely a scientific issue, but also a bureaucratic one (La Rocca, Nardi, 1994). The research question to be answered is not only “what is preventive conservation?” but “how to convince the local government that such an approach, which includes specific types of expenses, is necessary?” (Van Balen, Vandesande, 2013).

In order to tackle this problem, the researchers introduce a response that contributes to the viability of PPC in the expanding discourse of built heritage.

A promising contribution - New service by Monumentenwacht Vlaanderen: Maintenance Cost Analysis

Since 2011 the Monumentenwacht Vlaanderen developed a new service, Meerjarenonderhoudsplanung met kostenraming (MOP) or Maintenance Cost Analysis, which offers tailor-made maintenance plans that calculate the recommendations of the architectural inspections over a period of 6 years for building owners and managers. Important to note is that the MOP only includes maintenance recommendations and no restoration interventions. In case of a restoration, the members are - and this is also the case in the architectural report - referred to specialists (restoration-architects, structural-engineers, specialized glassworkers, etc.).

The MOP maintenance plan is drawn-up per individual property and includes the following information:

- 1 - The report of the architectural assessment;¹
- 2 - A description of the recommended interventions grouped by type of work (i.a. painting, roofing and works on roof structures);
- 3 - The quantity and frequency of the required interventions;²
- 4 - An indication of the cost for each intervention based on material cost and man-hours;
- 5 - An indication of the cost per year;

6 - An indication of the cost scheduled over a period of 6 years.

¹ The starting point of a MOP is the architectural assessment by the Monumentenwachters, which cannot be older than 2 years in order to provide actual advice.

² The urgency of the recommended maintenance interventions is based on the categorization of recommendations of the initial architectural report. The maintenance plan indicates how often an intervention should be carried out.


Meerjarenonderhoudsplanung met kostenraming																
		Adres Sint-Luciakerk Engelsbergseweg z.n. - 3980 TESSENDERLO Objectnummer 30007 Datum 21/12/2012														
		code rapport	locatie gebouw	omschrijving	meiscode	eenheid	hoeveelheid	frequentie	prijs / eenheid	totaal / jaar	2012	2013	2014	2015	2016	2017
Dakwerken																
4.1.	sacristie [9]	Dakwerken		sog	1	1	eenmalig	350,00	350,00		350,00					
Herstellen en optimaliseren van de aansluitingen van de zakgoot met de steunberen van het koor [1]																
4.1.	zijkruis [9]	Dakwerken		sog	1	1	eenmalig	250,00	250,00		250,00					
Opnieuw solderen van de kleine scheurtjes op beide uiteinden van de goot																
Dakstructuren en zolder																
3.1.	zolder [9] [10]	Dakstructuren en zolder		sog	1	1	eenmalig	400,00	400,00				400,00			
Optimaliseren van de verankering tussen de muurplaten en de horizontale balkjes - alle horizontale balkjes met min. 2 nagels vermagen met de muurplaat																
11.1.2.	zolders [9] [10]	Dakstructuren en zolder		vh	m	34	eenmalig	125,00	4.250,00				4.250,00			
Aanbrengen van een borstwering met tussenregel en stootplank ter hoogte van de bestaande loopbruggen																
Buitenschrijnwerk																
11.3.	toren [9]	Buitenschrijnwerk		vh	m2	12	eenmalig	125,00	1.500,00			1.500,00				
Plaatsen van een duivenwerend net aan de buitenzijde van de galmgaten																
Schilderwerken & afwerkingen																
5.6.1.	alg	Schilderwerken & afwerkingen		vh	m2	70	eenmalig	25,00	1.750,00						1.750,00	
Opnieuw verven van de cementering met een duurzame verf																

Fig. 1 - Image MOP maintenance plan © Monumentenwacht Vlaanderen.

All collected data is processed analogous and linked to a cost library. This library based on the ASPEN INDEX, a Building Cost Data reference work (ASPEN INDEX 2014), and several contacts with contractors. The data provided in cost library and therefore the MOP are an indicative estimation. In practice, the actual prices will be determined by the contractor, materials and techniques that the building owner or manager selects.

Currently the MOP is implemented for 60 built heritage properties in Flanders. Interesting to mention is that similarly to “GutterClear” by Maintain our Heritage (Dann, 2013) church councils prove to be a particular market. In the case of Flanders this can be attributed to the decree on the material organisation and operation of recognized religions adopted by the Flemish

Government in 2004 (Belgisch Staatsblad: 16.08.2012). It includes an obligation for church councils to make a multiannual plan and budget for their properties.

Next to church councils, also public and private built heritage owners and managers understand the benefits of MOP. Monumentenwacht can hardly cope with the large demand for MOP from their members and therefore plans to integrate the service into its first-line activities. Consequently, a cost library is being developed based on the executed maintenance works and contact with the contractors in the maintenance market. Moreover, Monumentenwacht is in the process of creating a web-based tool to organise, preserve and disseminate the information collected through MOP. The main goal is to spread the results throughout different networks of interested actors, provide an overview on the condition of the buildings covered by Monumentenwacht and help to bridge the gap in the maintenance market.

It is anticipated that this cost library will be implemented in the MAKSbo (Monumentenwacht General Quality System for architectural inspections) database. The database aims to produce more statistic information, reduce the reporting time for the Monumentenwachters and provide a clearer format for the owners and managers of the inspected properties. The MAKSbo is currently being developed in line with the MAKSin (Monumentenwacht General Quality System for interior inspections) database that Monumentenwacht Vlaanderen started building in 2007 to facilitate the recording, management and reporting of the interior assessments. From 2013 on Monumentenwacht Vlaanderen focused on the MAKSbo. At this time it entails a basic database constructed Microsoft Access, with member, object and inspection information. The actual inspection reports are drawn up in a fixed scheme within a Microsoft Word-template and supported by computer-aided design in Vectorworks. The database structure centralizes the data of the 5 provincial Monumentenwacht associations and is frequently compared with similar databases, such as COMEET from Monumentenwacht Noord-Brabant in The Netherlands.

Monumentenwacht Vlaanderen will further develop this database in the future by implementing MOP and by prospecting the most appropriate structure to enable an open source, web based and possibly georeference database. This will provide a link with other information systems, i.a. the heritage inventories established by the Flemish Agency for Immovable Heritage.

Moreover, considering that previous member surveys and research showed that the money invested by private owners in the maintenance of their property

is quite high (Monumentenwacht Vlaanderen, 2011), the results of the MAKSbo and MOP can contribute to proving the effectiveness of PPC for public and private owners, local and national governments and perhaps even achieve a change in attitude of society towards the conservation of built heritage properties.

Conclusion

Several important issues to understand PPC today have been explored in this paper. The increasing attention for PPC in the research field since the last 3 decades has been addressed. Because of the growing variety of definitions, the researchers provided an overview of the most commonly accepted external benefits of PPC. Moreover, a working definition is put forth that embodies a more up to date and consistent overview of the concept and practice of PPC. It produces a better understanding of PPC both in research and dissemination.

Following the theoretical implications of PPC, the paper moved towards its practical implementation in today's urban environment. Thereby the focus was put on the organisation and work method of Monumentenwacht Vlaanderen, a well-established, experienced and highly professional organisation that embodies PPC in the real world.

Next, the researchers introduced a problem statement. Despite the growing research interest, promising examples and well-established model of Monumentenwacht, there is a problem with embedding PPC with full understanding of long-term effects which unfortunately results too often in postponed interventions and costly restorations. This statement is supported by similar developments in policy and international researches that were observed both in Flanders and on an international level. It is argued that this is mainly due to the expanding discourse of built heritage.

To meet the demands of a new policy that stresses sustainable development as a central goal and to tackle the diminishing public financial resources directly allocated the built heritage, the innovative service of Monumentenwacht Vlaanderen, Maintenance Cost Analysis which presents a particular interest in the new tendency to quantify the impact of heritage.

Bibliographic references

Cassar M. (2009), Heritage: Challenges and Strategies for the Twenty-First Century, *Association for Preservation Technology Bulletin*, 40:1, 3-11.

Dann N. (2013), Preventive conservation maintenance in England: constraints, opportunities and lessons. In Van Balen K., Vandesande A. (ed.),

Reflections on Preventive Conservation, Maintenance and Monitoring of Monuments and Sites by the PRECOM³OS UNESCO Chair. Leuven: ACCO: 95-100.

Dann N., Cantell T. (2005), Maintenance: From Philosophy to Practice, *Journal of Architectural Conservation*, 11:1:42-54.

Dann N., Wood S. (2004), Tensions and omissions in maintenance management advice for historic buildings, *Structural Survey*, 22:3,138-147.

Della Torre S. (2013), Planned conservation and local development processes: the role of intellectual. In Van Balen K., Vandesaende A. (ed.), *Reflections on Preventive Conservation, Maintenance and Monitoring of Monuments and Sites by the PRECOM³OS UNESCO Chair*. Leuven: ACCO: ii-iv.

Della Torre S. (2014), Shaping Tools for Built Heritage Conservation: from Architectural Design to Program and Management, lecture given during the 2014 Raymond Lemaire International Centre for Conservation Thematic Week.

Feilden B. (1994), *Conservation of historic buildings*. Oxford: Butterworth Architecture.

Fonds Raymond Lemaire (1921-1997), Radio interview 1975 on the occasion of the European Architectural Heritage Year. In *University archive KU Leuven* (BE / 212934 / P 225), ODIS - Database Intermediary Structures Flanders: Record 3401.

Forster A., Kayan B. (2009), Maintenance for historic buildings: a current perspective, *Structural Survey*, 27:3, 210-229.

Gordon R., (1983), An operational classification of disease prevention, *Public Health Reports*, 98:2,107-109.

ICOMOS, *Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage*, Ratified by the ICOMOS 14th General Assembly, Victoria Falls, 27-31 October 2003.

La Rocca E., Nardi R. (1994), Preventive conservation and restoration: a matter of costs. In: Ashok R., Smith P. (ed.), *Preventive conservation practice, theory and research: preprints of the contributions to the Ottawa congress*. London: International Institute for Conservation of Historic and Artistic Works: 24-27.

Mansfield J. (2008), The ethics of conservation: some dilemmas in cultural built heritage projects in England, *Engineering, Construction and Architectural Management*, 15:3, 270-281.

Mills E. (1994), *Building maintenance and preservation*. Oxford: Butterworth-Heinemann.

Monumentenwacht Vlaanderen, 20 jaar Monumentenwacht: tevredenheid enquête, 2011.

Morris W. (1877), *The SPAB Manifesto: The Principals of the Society for the Protection of Ancient Buildings as Set Forth upon its Foundation*. Retrieved from: www.spab.org.uk/what-is-spab/the-manifesto/ (last consulted 10/04/2014).

Pearson M., Sullivan S. (1995), *Looking after heritage places, the basics of heritage planning for managers, landowners and administrators*. Melbourne: Melbourne University Press.

Power A. (2010), Housing and sustainability: demolition or refurbishment?, *Urban Design and Planning*, 163:4, 205–216.

Ruskin J. (1885), The Lamp of Memory. In Tinker C. (ed.) (1908), *Selections from the works of John Ruskin*. Cambridge: The Riverside Press.

Stulens A., Verpoest L. (2006), Monumentenwacht: a monitoring and maintenance system for the cultural (built) heritage in the Flemish Region (Belgium). In Patricio T., De Jonge K., Van Balen K. (ed.), *Conservation in Changing Societies: Heritage and Development. Proceedings of the international conference on the occasion of the 30th Anniversary of the RLICC*. Leuven: European Association for Architectural Education, 31:191-198.

Thomsen A., van der Flier K. (2009), Replacement or renovation of dwellings: the relevance of a more sustainable approach, *building research & information*, 37:5-6, 649–659.

Van Balen K. (2011), *Preventive conservation in the international context of the PRECOM³OS network*, Nanjing: International Conference on Preventive Conservation of Architectural Heritage Proceedings: 1-13.

Van Balen K. (2013), Introduction. In Van Balen K., Vandesande A. (ed.), *Reflections on Preventive Conservation, Maintenance and Monitoring of Monuments and Sites by the PRECOM³OS UNESCO Chair*. Leuven: ACCO: ii-iv.

Van Balen K., Vandesande A. (2013), Preventive conservation of built heritage: foresight and needs. In Van Balen K., Vandesande A. (ed.), *Reflections on Preventive Conservation, Maintenance and Monitoring of Monuments and Sites by the PRECOM³OS UNESCO Chair*. Leuven: ACCO: 152-156.

Worthing D., Dann N., Bond S. (2002), *Issues in conservation management*, Glasgow: Proceedings of the CIB W070 2002 Global Symposium: Applying and Extending the Global Knowledge Base: 292-302.