Minimal intervention and decision making in conserving
the built heritage

by

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A thesis submitted to the Faculty of Graduate and Postdoctoral
Affairs in partial fulfillment of the requirements for the degree of

Master of Arts

in

Canadian Studies

Carleton University
Ottawa, Ontario

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Abstract

This thesis analyzes the principle of minimal intervention in built heritage conservation in order to determine its relevance for today's heritage field. The origins and evolution of minimal intervention are analyzed in early conservation projects and heritage doctrines, in 20th century charters and legislation, and in the present context of values-based conservation and sustainability. This research shows that while the principle was developed in close connection to material authenticity and the historic value of monuments, more than one type of minimal intervention can be identified today. Further, the thesis proposes a new definition to minimal intervention, one that takes into account the impact of conservation decisions on all the values of a place and on all the stakeholders involved. It asks to consider minimizing the impact of conservation measures not only on the material fabric of places, but also on their associated values, users, broader community and even the planet.

Acknowledgements

I would like to acknowledge my wonderful thesis advisors Mariana Esponda and Victoria Angel who have provided me with insightful guidance, encouragement and constant support throughout all the phases of my graduate studies at Carleton University and particularly the thesis research and writing process. I also extend very warm thanks to Keith Blades who has first introduced me to some of the most interesting conservation projects currently taking place in Ottawa. Our many discussions on materials conservation and decision-making provided one of the main starting points for conducting this research. I would also like to thank my colleagues at Robertson Martin Architects for their ongoing support and for the wonderful opportunity to be involved in a number of exciting and challenging heritage conservation projects which have provided further inspiration for this research. Many other people have helped make this thesis a reality and I am genuinely grateful for their interest, insights and support.

Table of Contents

Abstract.....	i
Acknowledgements	ii
Table of Contents	iii
List of Tables	vi
List of Illustrations.....	vii
1. About the research.....	1
2. Background	6
2.1 Definitions.....	6
2.2 State of knowledge on minimal intervention.....	13
2.3 Study area and limitations of the research	18
3. Evolution of the minimal intervention principle.....	21
3.1 Renaissance to mid 20 th century	21
3.1.1 Early beginnings, Italy and the Renaissance.....	21
3.1.2 French Revolution.....	22
3.1.3 Restoration of ancient monuments: 19 th century Italy and Greece	23
3.1.4 Stylistic restoration: Wyatt, Scott and Viollet-le-Duc	30
3.1.5 The anti-restoration movement	33
3.1.6 The first theorists	35
3.1.7 Post-war Europe.....	37
3.1.8 Towards the first charters: Athens Charter, Venice Charter, World Heritage Convention.....	39
3.2 Discussion on the origins of minimal intervention.....	39
3.2.1 Maintenance	39
3.2.2 Conservation of ruins or the cult of the artifact	42

3.2.3	Reactionary – in opposition to Stylistic Restorations	44
3.2.4	Reactionary – industrial revolution.....	44
3.2.5	Minimal intervention and new technologies.....	45
3.2.6	Minimal intervention and the crafts.....	47
4.	The minimal intervention principle in conservation Charters, standards and guidelines	50
4.1	International Context	50
4.1.1	Defining minimal intervention.....	51
4.1.2	Adaptive re-use and minimal intervention.....	56
4.1.3	Archaeology and minimal intervention	58
4.1.4	Authenticity and minimal intervention	59
4.1.5	Integrity and maintaining the layers of all time periods	61
4.1.6	Traditional versus new materials and techniques	63
4.1.7	Design, legislation, urban planning and minimal intervention	64
4.1.8	Discussions and conclusions to international legislation.....	68
4.2	Minimal Intervention in Canada	70
4.2.1	General Canadian context.....	70
4.2.2	First Canadian conservation projects and Charters.....	71
4.2.3	Standards and Guidelines.....	74
4.2.4	Local and provincial legislation.....	77
4.2.5	Authenticity and the Spirit of the Place	79
4.2.6	Conclusions to Canadian and North American legislation	81
5.	Today's context – applying conservation theory into practice. Examples from Ottawa, Canada.....	83
5.1	Heritage conservation in the 21st century.....	83

5.2	Authenticity.....	85
5.3	Sustainability and the environment.....	88
5.4	Values-based conservation.....	90
5.4.1	Use value.....	96
5.4.2	Economic value.....	97
5.4.3	Social value.....	100
5.5	Applying values-based principles in conservation work	103
5.5.1	Sustainable development and heritage-centered development	103
5.5.2	Living heritage	107
5.6	Materials conservation	110
5.6.1	General considerations.....	110
5.6.2	The purpose of conducting materials conservation	116
5.6.3	Materials deterioration, tests and analyses.....	117
5.7	Adaptive re-use, urban planning and code compliance	121
5.8	Evolution of heritage conservation theory over the past century and a half and its reflection into practice.....	125
6.	Conclusions.....	134
6.1	Minimal intervention in conservation theory and practice	134
6.2	The irreversibility of any level of intervention	141
6.3	Types of minimal intervention.....	142
6.4	Future directions of research.....	144
6.5	Concluding remarks	145
	References.....	147

List of Tables

Table 1 – Evolution of minimal intervention in relation to materials conservation	127
Table 2– Evolution of minimal intervention in relation to design and adaptive re-use..	130
Table 3 – Evolution of minimal intervention in relation to intangible matters	133

List of Illustrations

Figure 1 - The Coliseum, Rome - Stern's buttress. (a) overall image; (b) detail showing cracks and displaced stones 'frozen' in place.	24
Figure 2 - The Coliseum, Rome - Valadier's Buttress in 2008. (a) detail showing the rebuilt arches; (b) overall image.	25
Figure 3 - The Parthenon, Athens. Detail showing modern day anastylosis and filling in of lacunae with new, clearly distinguishable marble (2010).	27
Figure 4 - The Parthenon, Athens. Present-day restoration work ongoing (2010). New marble used to fill in lacunae is clearly visible.	29
Figure 5 - Densus Church, Romania.....	41
Figure 6 - Effects of improper use of modern techniques/materials in conservation work. (a) iron inserts causing stone cracks and spalling; (b) failed cement parging on historic masonry wall.....	46
Figure 7 - Gasometer Building, Ottawa. (a) new addition; (b) detail showing the connection between existing building and the addition.	128
Figure 8 - Gasometer Building, Ottawa. Bringing back the roundness of the space. (a) & (b) interior views at the upper level. (c) interior view of the HVAC at the intermediate level.....	129
Figure 9 - Canadian Museum of Nature, Ottawa. The building after the renovations (2013).	131
Figure 10 - Canadian Museum of Nature, Ottawa. Detail showing the new lantern tower and banners announcing the new exhibits (2013).	132

1. About the research

This research is focused on the *critical examination of the practice of heritage conservation*, particularly by analyzing one of the foremost conservation principles, '*minimal intervention*' (i.e. the concept that intervention during heritage conservation activities should be kept to an absolute minimum) and this principle's relevance to the field of heritage conservation today.

The main research question that is pursued in this thesis is '*what minimal intervention means and if it remains a valid principle today*'. Specific objectives discussed include:

- Understanding how and why the principle appeared, when it was first used and how it evolved over time;
- Analyzing if and how the principle is addressed in the main heritage conservation charters, and national and international legislation. As these charters, standards, guidelines and codes of conduct represent both the basis of professional practice and an important tool for teaching new generations of heritage practitioners, it is highly important to determine how conservation principles, such as minimal intervention, are codified in these documents; and
- Studying how the principle is applied and practiced in today's context on the built heritage.

In order to achieve these objectives, the research was divided into five parts:

- a) review of existing literature on the topic of minimal intervention, analyzing the state of knowledge;

- b) analysis of key texts and theorists in order to determine the beginnings and evolution of the principle;
- c) review of charters and legislation, at the international level, and at the North American and specifically the Canadian level, to determine how the minimal intervention principle is addressed;
- d) discussing heritage conservation in the 21st century, the main challenges to classical conservation theory and the relationship between these challenges and minimal intervention, illustrated with examples from Ottawa, Canada; and
- e) contouring conclusions and discussing potential directions for the future.

The review of the existing body of literature dedicated to the study of minimal intervention helps identify the origins of the phrase ‘minimal intervention’ and when it first started to be used, and gives an overview of the existing material dedicated to the study of this principle and the broader field of critical conservation studies. Unfortunately, while there appears to be a rising interest in studying conservation theory and principles, most research that exists to date, that the author of this thesis has been able to locate until now, on the principle of minimal intervention is dedicated to analyzing it in a context of artifacts and collections conservation.

This preliminary review is followed by a more in-depth analysis of key texts for the theory and history of heritage conservation from primary sources such as Ruskin’s *Seven Lamps of Architecture* (1849), Boito’s *Carta del Restauro* (1883), Riegl’s *Moderne Denkmalkultus* (1903), or the Athens (1931) and Venice (1964) Charters, but also broader texts on the history of conservation such as Choay’s *L’allégorie du patrimoine* (1992) or Jokilehto’s *A History of Architectural Conservation* (1999). This second category of

sources provides both additional information to the primary sources used or for cases where the primary sources could not be located, but also provides a reference point on which to compare the analysis and interpretation performed. This review is carried out in order to determine what the principle of minimal intervention means and how it came to be. This analysis is focused on gaining an in-depth understanding of the history of heritage conservation and of the main changes that took place in the field over the past century and a half. By paying special attention is paid to references that different authors make, either explicitly or implicitly, to the different possible levels of intervention in general and the idea of minimal intervention in particular, this analysis seeks to determine the birth and evolution of the minimal intervention principle and understand the main causes, consequences and problems of this principle.

Based on this analysis, a number of conclusions are drawn with regards to the different factors and currents that led to the development of the minimal intervention principle. Most significantly, the idea arises that historically and philosophically, minimal intervention was developed in close connection with the concept of authenticity (i.e. that which is truthful and reliable in a building, traditionally considered especially in what concerns the original historic fabric of a building), and the monument seen as historic document. It is worth noting that up to this point (roughly the mid 1960s) the concept of minimal intervention is only referred to implicitly as no documents appear to make a direct mention of this phrase until the 1980s. Research by Roudet (2007) points to the same conclusion, that first mentions of “minimal intervention” appear only in the last two decades of the 20th century, and the so-called birth of the minimal intervention principle

is highly connected with the technical and scientific advancements of the 20th century, which gave the philosophical approach the means to be carried out into practice.

Next follows a review of the most significant charters and best practice guides, undertaken in order to determine how the minimal intervention principle is codified in practice. The analysis begins by looking at international documents from the *Venice* (1964) to the *Nara Document on Authenticity* (1994), the *Faro Convention on the Value of Cultural Heritage for Society* (2005) and the very recent *Paris Declaration on Heritage as a Driver of Development* (2011). The focus is then turned to North American and especially Canadian documents such as the *Deschambault Declaration* (1982), the *Appleton Charter* (1983), the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (1992), the *Declaration of San Antonio* (1996), and the *Standards and Guidelines for the Conservation of Historic Places in Canada* (2010).

The following part of this work explores a series of current key issues pertaining to the field of heritage over the last 10-15 years, as reflected in recent research reports, such as those undertaken by the Getty Institute, or other critical studies and scholarly articles. The main issues explored are concepts such as values-based conservation (including issues related to social, use and economic value), living heritage, sustainability and sustainable development. This exploration is undertaken in order to determine the relationship (if any) between these and the concept of minimal intervention and, generally, the place that minimal intervention plays in today's context. This analysis is further substantiated by the use of local examples from the Ottawa region, in order to demonstrate how the principle of minimal intervention is applied in practice, in various contexts, such as the conservation of the physical fabric of objects, design and adaptive

re-use or urban planning. This last part also draws on the author's own experience in architectural practice, working on conservation projects in Ottawa, which permitted to better observe the way in which conservation projects are carried out.

The research allows to draw a number of conclusions based on the afore mentioned analyses, the most important of which being that while the principle of minimal intervention remains a valid and worthy concept in theory, in practice it allows for significant relativity. Consequently, depending on the type of heritage that is being discussed and its specific context, the minimal amount of intervention that is considered necessary or even acceptable can vary greatly.

2. Background

This chapter seeks to further clarify the scope of this research by providing a brief definition of what heritage and minimal intervention mean today, analyzing the present state of knowledge on the theory of minimal intervention, and defining the limits of the study.

2.1 Definitions

Conservation, preservation and heritage conservation

Before advancing the discussion on the topic of minimal intervention a definitional distinction between the terms “conservation”, “preservation” and “heritage conservation” is deemed necessary. While “historic preservation” appears to be choice term for the US and is sometimes also used in international documents, the two terms “conservation” and “preservation” are generally understood to have distinct meanings. Namely, conservation typically refers to a complex of attitudes and actions aimed at safeguarding the character defining elements of a cultural resource, retaining its heritage values and ensuring the site’s survival. Preservation, on the other hand, constitutes but one of the means that can be used for the purpose of conservation – a process that is focused on maintaining and stabilizing the existing materials, form and integrity of a place or of one of its individual components. Preservation can perhaps be best understood in the context of the phrase “to preserve from harm” – that is harm to the fabric, form or significance of the place. In short, conservation can be considered as a way of thinking about heritage, or the end goal – ensuring that heritage values are maintained and enhanced, while preservation, together with other processes such as rehabilitation, restoration or consolidation, constitutes one of the means to the conservation purpose. Heritage conservation, or its American equivalent

– historic preservation, is generally understood to refer to the entire discipline involving treatment, preventive care and research directed toward the long-term safekeeping of all the different types of heritage.

Defining heritage in today's context

The late 19th century marks the beginning of the first concentrated efforts to develop a heritage conservation theory and accompanying principles. However, neither in the 19th century nor since then, as the following chapters will show, no single unified coherent theory of conservation was produced. Nevertheless, over the past century numerous charters, declarations and standards have been drafted worldwide to illustrate this theorization of the field and a number of principles and good practices have been developed to assist in conducting appropriate conservation interventions. Some of the most important good practice principles include: (i) documenting the state of the object prior to the intervention, (ii) performing historical research, physico-chemical analyses and investigatory openings in order to understand the object's evolution, (iii) respecting all of the object's historical layers, (iv) maintaining intervention to a minimum; (v) making new interventions recognizable from the original historic fabric and subordinated to the original, (vi) caring for the authenticity of the object, and (vii) using compatible materials when undertaking repair work.

However, over the past couple of decades, the field of heritage has been gradually expanding and has come to incorporate not just monuments and sites but “very recent buildings, military remains even of the Cold War, the semi-natural components of landscape, the intangible dimensions of heritage which are now recognised not only among Third World ‘First Nations’, the ugly and the painful as well as the beautiful and

uplifting legacy of the past, the idea of 'alive' heritage" (Council of Europe, 2009 p.30). As this expansion poses certain challenges to the field, below follows a brief incursion into potential definitions for the field of heritage conservation today.

Morris (1877) in the *Manifesto of the Society for the Protection of Ancient Buildings* defines what we now call heritage as any work which can be seen as artistic, picturesque, historical or antique, and over which would spur the interest of educated, artistic people. More than a hundred years later, Hardy (1988) refers to heritage as a 'value-loaded concept', stating that its very nature relates entirely to present circumstances and that the only referent that matters is the present. Brett (1993) defines history as being a verb, and states that heritage, likewise, is not a given, it is made and it is thus, unavoidably, an ethical enterprise. Further, Bender (1993) states that heritage is never inert as people continuously engage with heritage and re-work it either by appropriating it or by contesting it.

Harvey (2001) notes that heritage has always been with us and has always been produced by people according to their contemporary concerns and experiences. He goes on to say that every society has had a relationship with its past, even those that have chosen to ignore, forget, remember, memorialize and/or fake it, and that it is only through understanding this relationship between the people and their heritage that conservation activity has any chance at being successful. According to Fielden (2003), heritage, as practiced today, can be considered as a product of the wider social, cultural, political and economic transitions that have occurred during the past century and a half, and particularly in the last few decades. Over time, the concept of what heritage is has

developed or changed according to the contemporary context, power relationships and national, or local, identities.

The Council of Europe (2009) discusses heritage as object and heritage as action. Heritage as object refers to the new categories that have been added to cultural heritage whereas heritage seen as action refers to the new ways of doing heritage. These new ways include recognizing the importance of the local communities, and the need for greater democratic participation in conservation activities and reconciling heritage values with social attitudes, focusing on context rather than on the object itself, and recognizing the different ways to achieve a sustainable management of heritage, not only through the conventional conservation of physical fabric. For new types of heritage, the overall objective should not necessarily be preservation (process that is focused on maintaining and stabilizing the existing materials, form and integrity of a place or one of its individual components) but the management of change, to which end processes such as preservation are just one means.

Loh (2010) also recognizes that heritage is a non-renewable resource and that its conservation is a dynamic process that should be used as an instrument to understand and proactively manage cultural changes, while accepting that some heritage assets will inevitably be lost as part of this process. She states that heritage conservation is about sustaining a culture within a particular community by considering the community's physical and intangible values that are embodied in the built form and ensuring their survival and continuity.

As the examples and definitions discussed above show, today's definition of heritage is very broad, while at the same time quite imprecise. In this context, it is often difficult to say how conservation principles should be applied. As Petzet (2010) mentioned, a distinction needs to be made, when discussing conservation theory, between the different possible types of heritage. Furthermore, the belief that most of the discussions and most of the good practice principles can be applied, indiscriminately, to all types of heritage, should be avoided. Generally speaking, a distinction should be made between how conservation principles are applied for example on:

- Archaeological remains and ruins;
- Historic buildings that are inhabited or used by people on a regular, day to day basis;
- Historic structures such as heritage bridges or industrial heritage which may or may not still be in use;
- Places as defined in the article 1 of the *Burra Charter* (i.e. "site, area, land, landscape, building or other work, group of buildings or other works, and may include components, contents, spaces and views". These places may include "memorials, trees, gardens, parks, places of historical events, urban areas, towns, industrial places, archaeological sites and spiritual and religious places"; Icomos, 1999);
- Cultural landscapes (i.e. places of cultural significance that represent the combined works of man and nature);

- Living heritage (i.e. sites which share a very close and continuous connection with their core community, that are defined by the relationship with the community and vice-versa);
- Intangible matters as defined in Article 2 of the *Convention on Intangible Heritage* (i.e. “practices, representations, expressions, knowledge, skills – as well as the instruments, objects, and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage”; UNESCO, 2003);
- Artifacts and collections (i.e. movable heritage objects, that generally have no use associated with them and are exposed in museums and art galleries or are protected inside archives and conserved in a curatorial manner).

It is not the scope of this thesis to investigate the similarities and differences between these types of heritage, or the grey areas of overlap between different types of heritage, and the principles that can and should be applied to them. However, when discussing conservation theory, at the very least a clarification should be made on what type of heritage is actually being discussed. Otherwise the question that one would ask is how the principle of minimal intervention can be applied to the conservation of intangible aspects, customs, dances, rituals or culinary heritage and how can intervention even be defined in this context?

The minimal intervention principle

Minimal intervention generally refers to the idea that any intervention on heritage object (e.g. a historic building, an artefact or a landscape) should be kept to an absolute minimum in order to maintain as much as possible of the original fabric. In the words of

Sir Gilbert Scott from 1848, “the great danger in all restoration is doing too much, and the great difficulty is knowing where to stop” (after Null, 1985).

Minimal intervention can trace its origins to Ruskin (1848) and Morris’s (1877) ‘*Anti-Interventionist Movement*’ in 19th century Europe, and was later wholeheartedly adopted by both archaeologists and materials and collections’ conservators. In general, the principle is understood as referring specifically to minimizing the use of new materials and maximum retention of original material when performing repairs or rehabilitation work, seismic upgrades, or conducting adaptive reuse and changes to the use of a building with minimal alterations to its layout. Documents, as recent as the *Burra Charter* (1999), advise only doing as much as necessary but as little as possible to conserve the site as it now is. The paradox, however, is that while there is a growing demand that all repair or intervention should be kept to an absolute minimum while, on the other hand, there are also increased expectations of performance, safety and longevity coupled with cost restraints.

Minimal intervention is often characterized as the least bad option. It is also related to Merimée’s idea of ‘*primum non nocere*’ (English translation ‘first do no harm!’). However, in today’s context, within a heritage field that is both very broad and imprecise, applying the same principle in the same way to different types of heritage becomes next to impossible.

Minimal intervention is generally focused on the conservation of a place’s character defining elements, and more often than not on the ones that are associated with historical, original fabric. However, this thesis proposes that more focus should instead be placed on the not on the conservation of the building or place itself, nor on simply conserving its

character defining elements, but on the entire set of values that are associated with it, and on the larger relationship between the place, and local, regional and even global communities, the environment and even the planet as a whole.

2.2 State of knowledge on minimal intervention

Minimal intervention is considered as one of the most important principles of heritage conservation and one that anybody practicing in the field today has undoubtedly discussed numerous times.

However, while upon close inspection this principle can be found as referred to implicitly in the heritage conservation theory of the past century and a half, research shows that the phrase '*minimal intervention*' has started to become used more often only since the 1980s (Roudet, 2007). Certainly the minimal intervention approach is first and foremost a philosophical idea and theorists and practitioners (from the time of Ruskin and Morris) have long taken a position in favour of a minimalist approach in conservation and restoration. As it will be discussed in more detail in chapter 3, some of the most important reasons why this approach was recommended have to do with the strong emphasis that was traditionally placed on the historic value of heritage, on original fabric and on viewing the heritage object (often a monument or artifact of the past) as a historical document, whose authenticity must be maintained. However, Roudet (2007) argues that achieving minimal intervention in practice is highly dependent on the scientific developments of the early and mid 20th century and that the birth of minimalist intervention could not have been possible without these advancements. He argues that scientists, from Pascal and Mendeleev to Darwin and Freud, have not only given us the

necessary scientific means to carry out conservation operations with minimal damage to the historic fabric, but also contributed to enriching our perception of cultural heritage. This should also be coupled with the slow process of internationalization, institutionalization and regulation of heritage conservation, with the *Venice Charter* (written in the mid 1960s) and with the *World Heritage Convention* (from the early 1970s). The first version of the *Burra Charter* (1979) is one of the first documents to make reference to minimizing the effect of conservation activities on the material fabric. Article 7 states that “compatible uses are those involving no change, changes which are substantially reversible, or changes which have a minimal impact on the culturally significant fabric.” Article 3 of the revised 1999 edition also calls for a “cautious approach” stating that “conservation is based on a respect for the existing fabric, use, associations and meanings. It requires a cautious approach of changing as much as necessary but as little as possible.”

In 1986, the Canadian Association for the Conservation of Cultural Heritage (CAC) published its first *Code of Ethics and Guidance for Practice for Those Involved in the Conservation of Cultural Property in Canada* in which guide, the idea of limiting the intervention is central – preventive conservation is announced as one of the main objectives, to precede all direct interventions and when the conservation of a heritage object cannot be ensured without intervention, the conservator/restorer must limit his or her intervention to the minimum necessary for the object’s successful conservation. Article 18 of this Code of Ethics specifically states that restoration, if used, must be conducted in a context of minimal intervention. Further, in 1993, the European Confederation of Conservator-Restorers' Organisations (ECCO) adopted its own set of

professional guidelines. Article 8 of the E.C.C.O. guidelines states that “the Conservator-Restorer should take into account all aspects of preventive conservation before carrying out physical work on the cultural heritage and should limit the treatment to only that which is necessary”.

As it can be observed from the examples above, it was only at the end of the 20th century that minimal intervention received its name. Following the examples above, the majority of codes of practice, guidelines and international charters enacted, roughly, over the past two decades include some mention of the phrase minimal intervention (e.g. ICOMOS Principles for the Preservation of Historic Timber Structures, 1999; Standards and Guidelines for the Conservation of Historic Places in Canada, 2010). However, while the principle that can be said to have derived from archaeology and the conservation of ruins has subsequently expanded to include most of the heritage field, there is very little research on the minimal intervention theory (e.g. Clavir, 1998; Roudet, 2007), most of it being strictly focused on conserving artifacts and collections, with a particular focus on the conservation of paintings. There also appears to be somewhat insufficient research on the broader critical studies concerning the practice of heritage conservation although Muñoz Viñas (2005) makes a very interesting review of contemporary theories of conservation in opposition to the more classical theories. Still, although there are ample studies and discussions on the sphere of what heritage is, and what it is that we are trying to conserve, there is significantly less research on how we should go about conserving it. The concept of authenticity is perhaps the most remarkable exception in this sense, and it is noteworthy to mention that the study of authenticity is an area where Canadians such as Cameron (2008) and Stovel (1987) have played a significant role in advancing the

field and broadening the meaning of the concept. The discussion between minimal intervention and authenticity is discussed in more detail in chapter 5.2.

Today, the majority of the principles that have stood at the basis of heritage conservation for decades, and which have been taken for granted as being valid everywhere, every time, are starting to be questioned. The heritage field has been gradually broadening for the past few decades and has come to include not just ruins, monuments and sites, artifacts and collections but also natural sites, cultural and historic urban landscapes, or intangible matters, and this expansion poses a number of challenges for conservation theory. This change has been termed a paradigm shift and it can be associated with increasing discussions about managing change (Araoz, 2010), values-based conservation (Mason, 2006) and recognizing and conserving the processes behind the object instead of merely its static, temporal phases (Smith, 2010).

As a result of these changes, lately there has been some increased interest in discussing the role of minimal intervention in current practices. However, the majority of the publications focuses either on collections and artifacts (e.g. Villers, 2004; Roudet, 2007; Rubio Redonda, 2008) or discusses minimal intervention merely as a means to a purpose. Similar recent research in the area of collections conservation has questioned issues, such as reversibility, namely the idea that any conservation treatment applied to a historic place or object should be reversible (Appelbaum, 1987; Oddy and Carroll, 1999), durability (Muñoz Viñas, 2005) or restoration (Oddy, 1994) to name but a few of the more recent discussions. In terms of artifacts conservation, there is some consensus that minimal intervention may not be a universally applicable principle and that often, the so-called minimal intervention principle tends to lead more to non-intervention (Clavir,

1997). Villers (2004) talks about minimal intervention on canvas paintings and proposes minimal intervention as an insufficient guide to practice and introduces the concept of '*post minimal intervention*' (i.e. recognizing other values that the object in this case a painting, might represent, not just privileging the historical aspect). However, with the exception of few antic and medieval ruins which are cared for using a very curatorial approach, the discussion on artifacts conservation cannot be accurately applied to the majority of what constitutes the field of built heritage.

Ultimately, research that focuses on the meaning and validity of minimal intervention in the built heritage in general and in the Canadian context in particular is modest or insignificant. Although recent years have seen an increase in the use of the principle of minimal intervention, with the concept being either specifically referred to or implied in specialized literature and legislation, there has been no consistent research dedicated solely to understanding what minimal intervention means in the field of built heritage. As the principle is seldom properly explained in these documents, it can leave much room for interpretation, especially in regards to what the minimum actually is in a given field.

Understanding the way in which decisions are made and the role of heritage conservation theory and principles in making these decisions allows us to determine and establish better and more viable conservation practices, with long term results and a decreased rate of necessary maintenance and a longer period between rehabilitation projects. As a principle used both in conserving existing heritage and in teaching future generations of professionals, minimal intervention (with its two extremes: aggressive intervention and non-intervention) plays a very significant role with regards to both the

ethics and the sustainability of heritage conservation. In terms of heritage training, it should be noted that sometimes heritage practitioners only take one or two courses in heritage and that, even in more substantial heritage programs, the practical aspect is often given much less consideration than the theory of conservation. Thus, it is not uncommon for students to come out of such programs believing that conservation projects in the ‘real world’ work in the same way as they do on paper. Unfortunately this is seldom the case and that is why it is important for the theory and principles of conservation to be properly reflective of the intricacies, complexities and challenges of conservation practices. While intervening too much may cause significant damage to the character defining elements of a heritage object, non-intervention can also lead to permanently losing the same character defining elements, or, at the very least, more costly repairs and more aggressive interventions on the long run.

It is therefore important to be able to accurately determine the correct degree of intervention required by different heritage objects, and to understand the factors that can impact this fine balance. This discussion becomes even more complex when considering the fact that in today’s context heritage is generally expected, and required, to maintain all of its use, social, economical and heritage values, which can often be conflicting.

2.3 Study area and limitations of the research

The main focus of this thesis is analyzing the minimal intervention principle’s application in the field of the built heritage. The examples used to illustrate the concept focus specifically on the last decade, and local examples, from the Ottawa area, are predominantly used in order to see how the minimal intervention principle was applied in

practice and how it connects to emerging issues in the field of heritage conservation. Some of the examples discussed also represent projects of which the author of this thesis has a more intimate knowledge, having been part of the design team working on the conservation of the places referred to. Further, as the more significant changes to the theory of heritage conservation started to appear after the drafting of the *Nara Document* (1994), *San Antonio Declaration* (1996) and the revised version of the *Burra Charter* (1999), the examples analyzed in this research focus specifically on projects completed over the last 10-15 which are better able to illustrate the changes to the field.

As mentioned above, Canadians have already played a significant role in advancing the field in terms of authenticity and given Canada's multiculturalism, fairly recent history as a nation-state coupled with the strong representation, and long history, of indigenous people, and their particular relationship with what is commonly seen as heritage, this makes Canada a very interesting and motivating place in which to conduct this research. On the one hand, the colonial, post-contact, western-type heritage is still fairly recent, however it often does not maintain its original function or is used by different people and cultures than the ones who first built it. On the other hand, the country also has significant natural, archaeological and indigenous heritage and benefits from the indigenous point of view on heritage and its conservation. Furthermore, as Ottawa is the nation's capital, it benefits from a special framework in which conservation is conducted. As the city contains a large number of federal-owned properties, including of the numerous buildings in downtown Ottawa that constitute the Parliamentary Precinct, all interventions planned on these buildings need to be reviewed by the Federal Heritage Buildings Review Office (FHBRO) within Parks Canada. Other stakeholders

that are generally involved in heritage conservation decision making in Ottawa commonly include the Heritage Conservation Directorate (HCD) within Public Works and Government Services Canada, the National Capital Commission (NCC) and the City of Ottawa heritage planners. The input of these various stakeholders helps ensure that conservation decisions on high-profile and public buildings in the city correspond to the highest most current standards of conservation which makes Ottawa a very good place to test how theory is applied in practice.

3. Evolution of the minimal intervention principle

This chapter seeks to provide a brief overview of significant conservation projects, doctrines and theories and to determine how they relate to the principle of minimal intervention. The purpose is not to provide an in-depth analysis of the history of heritage conservation; others such as Choay (1992) or Jokilehto (1992) have done this already, and therefore this chapter relies in a significant large part on their description and analysis of the first few centuries of heritage conservation. In addition, a number of case studies and conservation theories are briefly analyzed in order to infer the birth and evolution of the minimal intervention principle. The timeframe analyzed in this chapter spans roughly from the Renaissance to the mid-20th century – namely the beginning of the first international conservation charters. This time span was chosen as it provides a diverse array of conservation projects which touch on the minimal intervention approach, but it is limited upstream to the 1960s and the drafting of the *Venice Charter*, as it represents the beginning of a new age in the history of heritage conservation. An analysis of international and national charters and guidelines and the way that they relate to the minimal intervention principle are undertaken in chapter 4.

3.1 Renaissance to mid 20th century

3.1.1 Early beginnings, Italy and the Renaissance

As early as 1162, the City of Rome declared Trajan's Column protected to ensure that it will never be destroyed or mutilated, however, this protection of an ancient Roman monument represents the exception and not the rule throughout most of the Middle Ages. For example, in 1375 the Coliseum was being used as a quarry for the building of

Rome's contemporary palaces after in past centuries its arches had been walled in and the space used for workshops, dwellings and storage while a church and later the Frangipani citadel had been erected in the arena (Jokihleto, 1999).

Over several centuries, Roman ruins and non-Christian remains were appropriated by the Papacy and Christianized, restored while obliterating all traces of ancient associations, repurposed or simply used as quarries for erecting new monuments. Significant sites and landmarks were re-presented through subtle reinterpretations of existing popular memories and Rome's pagan heritage was used as a device to enhance the authority of the Pope (Choay, 1992). One such example and one of the oldest projects that can be characterized as minimal intervention approach is the transformation of the Baths of Diocletian, in Rome, into the church **Santa Maria degli Angeli** by Michelangelo. He adapted only a section of the remaining structure of the baths to form the church, and limited the intervention to the interior, maintaining the ruin, incomplete aspect of the exterior. New material was generally added only where necessary, and changes to the structure and interior layout were kept to a minimum. Thus, the large cross-vaulted hall in the center became the transept and main body of the church and the main altar was located in the ancient natatio (Jokihleto, 1999). However, in 1749 Luigi Vanvitelli gave a new baroque look to the building, modified & redecorated the interior of the church, which distracts somewhat from the harmony of Michelangelo's volumes.

3.1.2 French Revolution

One of the most important moments in the history of heritage conservation is the French Revolution with the wide spread destruction that characterized it, followed by the nationalization and first inventories and the first legislation for the protection of historic

monuments. This period can be considered as both a key point for the beginnings of heritage and the beginning of a curatorial type conservation, as places and buildings start to lose their use, turning from living heritage to 'dead', static heritage, from noble residences and palaces to surplus buildings with no use while at the same time their artistic and historic values are beginning to be appreciated.

Immediately following the revolution, a strong hatred was still present for the clergy and nobility, royalty and all that symbolized it. Thus, although the value of their monuments was grudgingly recognized and the buildings were beginning to be inventoried and protected, many historic buildings could still be destroyed or affected by this hate, as for example the Notre Dame of Paris which lost its spire because it had a crown symbol on it. Heritage conservation in the 1830s France was characterized by a respect for the original character of buildings, but also by a lack of funds and skilled workmen, which had the effect of most restoration and conservation projects being undertaken strictly as minimal intervention, being mostly limited to urgent repairs. The next couple of decades saw the first projects of restoration, on a large scale, with funding, rather than simply performing maintenance, with Viollet-le-Duc as one of the main proponents (Jokilehto, 1999).

3.1.3 Restoration of ancient monuments: 19th century Italy and Greece

The reconstruction of the **Arch of Titus** in Rome, in the early 19th century is generally considered as one of the first examples of anastylosis (i.e. the process of reconstructing an ancient ruin or archaeological remains by reassembling the detached parts, replacing them in their original locations, while using only the necessary new material to stabilize the whole, without reproducing missing decoration or attempting to

restore the whole monument). While more than half the present fabric is new, the materials and craftsmanship of the new parts are clearly distinguishable. However, the changes that had taken place during the Middle Ages, when the arch had been turned into a fortification of the Fragipani family, was destroyed, and some parts of the original building were not recognized and were therefore removed during the reconstruction process (Jokihleto, 1999). What is more, as the arch was dismantled, then reconstructed filling in the lacunae with new material, however well distinguishable, and not merely conserved in its ruined form, and as its different layers of history were not recognized as having any value and therefore demolished, it is somewhat difficult to argue that this approach followed the rules of what is today generally referred to as the minimal intervention principle.

Figure 1 - The Coliseum, Rome - Stern's buttress. (a) overall image; (b) detail showing cracks and displaced stones 'frozen' in place.

Over the 19th century, two very different approaches were taken in the restoration of the **Coliseum**. The first one, by **Stern** (Figure 1), in the 1820s, of the Eastern side of the outer ring can be considered a truly minimalist intervention. Stern constructed a brick buttress to support the wall, and walled in the arches on this section of the wall while preserving all the stones in their original location, all the cracks and deformations. He also built a transversal wall to provide better structural support and he created it mirroring the existing walls. The second approach, by **Valadier** (Figure 2), almost 20 years later, was that of the West Wall. Here, the architect created another buttress by reconstructing a part of the wall to mimic the existing one. While travertine was only used in key points (for economic reasons), and the rest was built in brick, the brick was painted with a fresco to imitate the patina of the nearby travertine. A third series of interventions, by **Canina**, during the 1840s and 1850s, was a combination of the two, as he performed further repairs to the building in new material, yellow brick, but left it apparent and made no attempts to disguise it as historic material (Jokihleto, 1999).

Figure 2 - The Coliseum, Rome - Valadier's Buttress in 2008. (a) detail showing the rebuilt arches; (b) overall image.

While both of the first two approaches discussed achieved their desired purpose – to stabilize the structure and stop deterioration, the philosophy behind them and the impact on the building are significantly different and in a sense, none of the two can be considered a true minimal intervention approach. Ironically, as Valadier's buttress is achieved through a partial, in kind, reconstruction of the wall, the visual impact to the untrained eye is significantly reduced while Stern's brick buttress appears as a much more striking intervention. However, when considering the idea of authenticity for example, Valadier's imitation of patina and reconstruction of lost elements to appear original would hardly be considered appropriate. At the same time, while Stern's approach makes no pretense as being part of the original structure, and while it carefully conserved the position of all the stones, cracks and displacements, its impact on the fabric remains significant.

In **Greece**, the restoration of the **Acropolis** in the early to mid 19th century which began under the direction of **Leo von Klenze** was very respectful of the old material and attempted to only use marble and original material however, it also removed all the traces of more recent historic periods. When the excavations started, the Acropolis was still used by the army as a fortification, and apart from these fortifications, a large number of dwellings had been erected over the centuries between the walls of the ancient ruins. Both the fortifications and the small town of houses on the Acropolis were demolished during this period (Jokilehto, 1999). During excavations and demolition of the existing Turkish fortifications it was found that a significant part of these medieval additions had used material from the ancient buildings as construction material. From dismantling these later additions, restorers were able to use the salvaged material to rebuild parts of the

ancient Acropolis. One such example is the reconstruction of the temple of Athena Nike by the Chief Conservator Ludwig Ross. The temple had been completely demolished during previous centuries and its stones incorporated into the fortifications. When excavation on the Acropolis began in the 1830s, and the fortifications were taken down, a large number of fragments belonging to the temple were uncovered, as well as its original foundations. The temple was reconstructed on this location, to the height of the architrave, using almost entirely original fragments and integrating losses in simple forms with no details. The bas-reliefs that had been relocated to the British Museum were replaced with terracotta copies. Ross's work on the Acropolis was followed by that of Pittakis who continued the show respect to the original material and sought to limit his work to what could be done using the original material. However in order to maintain as much of the original material as he could, he also began to use external iron reinforcements and internal iron cramps (Jokilehto, 1999).

Figure 3 - The Parthenon, Athens. Detail showing modern day anastylosis and filling in of lacunae with new, clearly distinguishable marble (2010).

In the late 19th century, after significant damage to the structures on the Acropolis due to an earthquake, another major restoration/consolidation project began. This was carried under the supervision of **N. Balanos**, and lasted for the next 4 decades until 1940. Unfortunately, despite a certain amount of respect for the original material and for the process of anastylosis as preferred intervention method (Figure 3), Balanos performed the reconstructions quite poorly, not verifying or trying to determine the original position of the pieces, and often mixing the blocks or using parts from different structures. He also used concrete to fill in lacunae and iron clamps and dowels to connect the pieces together. As quality of work was generally lacking, with connections between stones roughly executed, this quickly led to problems with the iron clamps rusting and damaging a large number of the original stones (Jokilehto, 1999).

During the early 20th century, a second reconstruction of the temple was undertaken, largely due to the structural instability of the bastion on which the temple sat. This work was conducted under the partial supervision of **Orlandos** who had noticed a number of problems with the original anastylosis, most referring to the incorrect positioning of the blocks. Therefore, much more attention was paid now to the correct position of the original blocks. However, lacunae were filled in old rather than new marble and missing decorative blocks were replaced with replicas rather than simple, geometric blocks (Jokilehto, 1999).

Figure 4 - The Parthenon, Athens. Present-day restoration work ongoing (2010). New marble used to fill in lacunae is clearly visible.

If one was to submit these approaches to the restoration of the Acropolis to the test of minimal intervention, none of them would correspond to all the tenets. Firstly, reconstructing the ruins at the expense of demolishing the existing buildings would be undoubtedly questioned. Second, the use of materials such as iron, cement or reinforced concrete would likely be largely disapproved as well, as would be the idea that if anastylosis were to be performed, limited importance should be given to the correct position of the elements. Similarly, neither the filling in of lacunae with undistinguishable, new materials and exact replicas would be accepted, nor would the idea of dismantling a previous restoration in order to correct existing mistakes would be lightly approved. However, all the different approaches also had their positive impacts and respond to different tenets of the minimal intervention approach in their own way, and perhaps, without these interventions, all the ancient remains on the Acropolis would have been entirely lost today (Figure 4).

3.1.4 Stylistic restoration: Wyatt, Scott and Viollet-le-Duc

In England, **John Wyatt** was, at the end of 18th century, one of the first to conduct restoration projects in what came to be known as the “unity of style” approach. The next major proponent of this approach was **Sir Gilbert Scott** (after Null, 1985). Scott (1850) argued that the monument is an historical document and that additions are part of that document, but that the needs of the present may take priority over preserving the historical document. Scott was also the initiator of the R.I.B.A.'s *General Advice to Promoters of the Restoration of Ancient Buildings*. This practical guide called for accurate documentation before restoration, cleaning and protecting paintings and finishes, consolidating decayed stone rather than rebuilding and not restoring ornamental work or sculpture. In general, preservation was preferred to repair in order to protect the historical value and authenticity of old buildings. The guide also cautioned against stylistic restoration or favouring one style over that of subsequent periods (I.B.A., 1888). The concept of authenticity was also discussed within the guide stating that new work (on additions for instance) should be distinguishably new and not merely a copy of the old work, such work thus having the chance to become historic in its own time. The guide also advocated examining other buildings of the same style or by the same architect when sufficient evidence about the original design of the building may be lacking (I.B.A., 1888). However, this principle of analogy, though sometime still used today has been since often criticized as being unreliable and often producing results that are quite different than the original building (Null, 1985).

In France, after the position of Inspector General for Historic Monuments was established in 1830, some of the country's first systematic restoration projects began. One of the most noteworthy examples for this research is the case of the restoration of the church of La Madeleine in Vézelay by **Eugène Viollet-le-Duc** during the 1840s and 1850s. When work on the church started, the building was in a great state of disrepair due to a combination of factors such as neglect, misuse and vandalism during the French Revolution. The church also displayed a mixture of architectural styles, starting with the Romanesque nave and ending with an early gothic Choir. The last three bays of the nave before the Choir had been rebuilt in the thirteenth century in the Gothic style, at a higher level than the adjacent Romanesque vaults leading to structural problems and the aisle roofs had been rebuilt at a higher level than the original, thus blocking nave windows (Jokihleto, 1999).

When he started the first investigation, Viollet-le-Duc found the narthex to be the only part of the ancient building structurally sound, with the Romanesque nave badly deteriorated and poorly built originally. The first set of works carried out on the building focused on the nave, its transversal arches, the flying buttresses and roof structure of the side aisles. The work consisted of demolishing and rebuilding large parts of the building, often making "improvements" to the original elements (i.e. the flying buttresses were redesigned to give them a more structurally correct form; the transversal arches of the nave were rebuilt in their original semicircular form; the new vaults were built lighter in weight than the originals). After some discussion with the Commission for Historic Monuments it was decided that three of the four gothic vaults at the east end of the nave were to be demolished and rebuilt in the earlier, Romanesque style of the rest of the nave.

The last nave, next to the choir, was left in its Gothic form because it appeared to be structurally sound and formed a transition between the Romanesque nave and the Gothic transept and choir. While originally only repairing or partial rebuilding of some elements was foreseen, the work actually carried out entailed the complete dismantling and subsequent reconstruction of large parts of the building (Jokihleto, 1999). Further, while the first phase of work was mostly focused on addressing structural problems and basically saving the building from imminent collapse, the second stage of works was focused mostly on the aesthetic aspects (i.e. a new design for the tympanum, replacing column capitals with either replicas or new design).

As with all the other discussions on the topic of the restoration of the church, the main reasoning for the proposed changes was related to the structural stability of the building. However, it can be assumed that aesthetic and philosophical reasons also played a part in this early example of ‘*stylistic restoration*’ or ‘*complete restoration*’ as they came to be known. His famous definition of restoration in the *Dictionnaire raisonné de l’architecture française du XIe au XVIe siècle*, which states that “to restore a building is not only to preserve it, to repair it, or to rebuild it, but to bring it back to a state of completion such as may never have existed at any given moment” has spurred numerous discussions and in time many theorists have disagreed with this approach to restoration. Certainly, if his work were to be compared against the minimal intervention principle, it would be hard to consider that his approach was minimalist in any way. Still, as Choay (1992) mentions, his systematic approach to restoration, documentation, *in situ* analysis and protection of fragile sculptural elements, as well as his great interest in historic construction techniques and architecture history, should not be disregarded. While some

of his interventions and stylistic alterations would today be considered unfounded or not necessary, one cannot ignore his contributions to the advancement of the field.

At the same time, it is also important to note the significant importance that Viollet-le-Duc's approach to restoration and conservation had on the theory and practice of heritage conservation over the following decades. The stylistic restorations that Viollet-le-Duc, Scott and other restorers of the period performed, ended up being so severely criticized that a significant part of the conservation principles formulated in the early to mid 20th century (many of which are still accepted as valid today) are based on condemning and forbidding any type of intervention that can be related to ideas such as '*stylistic unity*', '*complete restoration*' or '*stylistic restoration*'. This is discussed further in chapter 3.2 but it is important to note that in that same period, that Viollet-le-Duc was conducting his most famous and most criticized works, von Quast for example, Prussia's first Conservator, was advocating for avoiding artistic/archaeological restorations and purifications, respecting all parts that had artistic or historic value, and limiting improvements to a minimum, only to what was required for safety reasons, and only removing faulty, poor, or valueless parts or later additions to a building.

3.1.5 The anti-restoration movement

Ruskin (1848) sees restoration as '*a lie from beginning to end*' and argues that one cannot restore and bring life back to a building. For him, the old stone walls still have some life in them, a connection with the original builders and craftsmen, whereas new stones would have none. He advocates preserving the buildings for the life in them, for the memories that lie in their walls, as an honour to our forefathers (on a small scale) and to the nation as a whole. Ruskin also introduces the notion that the buildings do not

belong to us, but partly to those who built them and partly to the future generations, whose right to enjoy the buildings in the years to come we are not entitled in disturbing.

Ruskin is one of the first to see the value not only in major monuments but also in what we would now call minor or vernacular architecture. He was also one of the first to realize both the artistic and historic value of the common building and the urban fabric. For him, what sets the historic building apart as unique from any other building or work of art is its age, its history, the time and events which are contained and expressed in its physical fabric. He stated that the visible signs of history had emotional and artistic value in and of themselves, in addition to their documentary value (Null, 1985).

Ruskin believed that no matter how skilful the restorations of Viollet-le-Duc were, they remained 19th century conceptions, that the replacement statues were not medieval art, but only medieval subjects executed within the artistic consciousness of the 19th century craftsman. He stated that while another spirit may be given to a building by a different time period, this is then a new building (Ruskin, 1848). He did not address the idea that a new spirit may be imparted to an old building while the authentic spirit and fabric of the original is simultaneously retained as this would have required a conception of restoration as additive in nature, rather than destructive, a position not yet formulated in his time (Null, 1985).

Ruskin addressed the idea that architecture is perceived simultaneously as a whole and as its parts, thus new elements inevitably alter the perception of the whole to some extent, and the more they imitate the lost or the authentic remains, the higher the misrepresentation of the building as a whole will be (Null, 1985). In 1878, **John Stevenson** further stressed the importance of the monument as an historical record,

whose value as a document should not be compromised in his lecture at the R.I.B.A., *Architectural Restoration; its Principles and Practice*. He stated that all periods of history are equally worthy of preservation, which Tschudi-Madsen calls the "principle of equivalence", in opposition to the "principle of preference" or unity of style, which consists of choosing one period over another (Tschudi-Madsen in Null, 1985). Stevenson concluded his lecture by quoting Talleyrand: "When in doubt, do nothing" (Null, 1985) – truly a minimalist or perhaps an even fatalistic approach.

In this context, it is also interesting to note that the Ancient Monuments Act of 1882 was directed towards the protection of prehistoric ruins in the UK, and later, in 1913, enlarged to include ruins of later day, provided they were not in use.

3.1.6 The first theorists

After the 19th century, during which extensive restoration work was performed, intensive debates about restoration and anti-restoration were taking place, and the first legislative frameworks were emerging, the end of the 19th century and particularly the beginning of the 20th century saw the beginning of a more developed conservation theory and principles and even the drafting of the first international charters and guidelines.

Among the more interesting concepts discussed around the turn of the century is **Weber's** proposed distinction between dead and living monuments. According to this classification, pure ruins require minimal protection, dead buildings should be maintained so they don't become ruins (or can be restored or reconstructed depending on their artistic value), whereas for living buildings priority should be given to their artistic values. (Jokilehto, 1999).

Boito (1893) lays out a theory of conservation that rejects the dualism between the stylistic restoration school and the pure conservation school and proposes a synthesis of elements from the two schools. This approach has been called *Restauro Moderno* and consists of a critical approach that “distinguishes between layers of intervention in order to present the historical structuring of buildings in their material authenticity”.

Boito was one of the principal authors of the *Carta Italiana del Restauro* (1883), which stated that the monument has stratifications, and that all of them have their value and should be respected. He also mentions that while the oldest buildings are, in general, more venerable than younger ones, when the aesthetic value of a newer building is very significant, it may take precedence over age. (*Carta Italiana del Restauro*, 1883).

Boito’s approach was that architectural monuments should be consolidated rather than repaired, and repaired rather than restored, avoiding additions and renovations to them. He proposes three types of restoration, depending on the age of the monuments: *archaeological* for antiquities, where only anastylosis is permitted; *picturesque* for medieval monuments which should be treated through conservation, following a minimal intervention approach; and *architectural* for Renaissance and more recent monuments which allows for their restoration, and filling in lacunae with distinct new material.

Riegl, apart from introducing his famous discussion on the values of historic monuments in the *Moderne Denkmalkultus* (1903), generally advocated for a minimal intervention approach in conservation, and for limiting restoration to that which is strictly necessary for the preservation of the building.

Luca Beltrami introduced the notion of *restauro storico* which states that each building is a unique and distinct case and needs specific criteria for its restoration. He

also stated that the monument is a document whose different constructive stages are to be recognized and preserved. On the other hand, he showed that restoration should be based on analogy through objective appraisal and documentary knowledge (e.g. old engravings, archaeology, history, detailed analysis of the existing construction) (Jokilehto, 1999). In practice, historical restoration is not always successful due to the inadequate interpretation of documentary sources, and sometimes causes excessive and erroneous restorations, and (apparently) legitimates reconstructions.

Giovannoni encouraged the use of Boito's *restauro scientifico* on all buildings, not just the classical monuments. This can be seen as expanding the field of heritage to include more than the antiquities, but it can also be seen as the beginning of the expansion of the field of heritage to what we can see today. He also developed the philological and critical approaches to restoration: while the first treated the building as a document, which should not be falsified, the second dealt with restoration work on a more case by case basis (Jokilehto, 1999). Just as Weber, Giovannoni makes a distinction between live monuments which can be reused with minimal adaptations, and dead monuments belonging to disappeared cultures or with extinguished uses which should only be stabilized.

3.1.7 Post-war Europe

The destruction caused by the two World Wars and the reconstructions that followed all around Europe called all previous conservation theory into question. The buildings that were restored and reconstructed were triaged decided mostly on economical reasons – what can be restored or reconstructed with the least amount of work. Generally, the approaches to reconstruction adopted have varied broadly, from

anastylosis to unity of style and from respectful additions and reconstructions to complete replacement. As discussed by Schmidt (2001), the destruction wrought in the two World Wars brought a dire need for reconstruction - mainly of castles, churches and other prominent historic buildings, many of which were reinstated in a way which did not give any indication of the devastation they had been through. Some of the destructions were kept as ruins, some were reconstructed in a way that obliterated all trace of destruction, others accepted the past and closed the wounds in a sober, respectful way that keeps their memory alive, others again accepted the wounds and included them but chose to move on and look for a new beginning in their design (Schmidt, 2001).

Different national and local authorities and conservators took to reconstruction in different ways and their motives were different as well, ranging from defiance to respect for the past and national pride. The reconstructions in post-war Europe, even in an era which was beginning to be dominated by the modern architectural currents, can almost be called a social phenomenon, as most cities affected by the war chose to reconstruct at least some of their treasured monuments. One of the interesting questions that arise though is not only if the reconstructions can still be called monuments, or heritage, but also if these interventions can actually be considered minimal. As it will be shown in subsequent chapters, the answer is yes, to a certain extent, these reconstructions can be considered as following the minimal intervention principle, in a broader sense.

3.1.8 Towards the first charters: Athens Charter, Venice Charter, World Heritage Convention

The 20th century also brought with it the Modernist doctrine which argued that all that is old is bad, that historical styles are antiquated and should not be used, that ornament is a crime, and brought with it a desire to tear everything down and build anew. In this context, and as a reaction both to the destruction caused by the Wars and to the modernist doctrines in architecture, as well as in keeping with the 19th century and early 20th century conservation theories, the field and practice of heritage conservation began to be contextualized on an international scale with the 1960s and 1970s, marking the first major international documents and the start of the '*age of the professionals*'.

3.2 Discussion on the origins of minimal intervention

As noted above, until the end of the 20th century, there does not seem to be an actual mention of the phrase '*minimal intervention*' in heritage conservation theory. However, although it had not yet become a universally quoted principle, references to it can be seen in a large number of situations, as illustrated in the previous examples. In the following sub-chapter the origins of minimal intervention are analyzed, based on the examples addressed above, trying to identify some of the factors or events which led to the creation of the minimal intervention principle.

3.2.1 Maintenance

Most probable the first form of minimal intervention was and remains ongoing maintenance. As the Canadian Standards and Guidelines states it is better to repair than replace, and to replace in kind than to restore or to rebuild. This frame of mind is also

connected with Riegl's use value (1984) – something that is used is generally repaired and maintained. It is also generally much cheaper to repair a place that is used continuously because you are aware when problems arise. Also, conservation and restoration work is typically expensive, and in times when there were no funds for proper conservation work only the bare minimal repairs would typically be carried out. It should also be noted that many theorists, from Ruskin to today, have called for the continuous care and maintenance of historic places. In the words of Nelson "historic buildings would seldom need to be preserved, restored, or rehabilitated [except to update systems] if they were properly maintained" (after Nelson in Kelley & Look, 2005).

It can be argued that traditionally, this repair and maintenance was what constituted the minimal intervention to maintaining buildings functional. However, this also sometimes meant that successive adaptations were made to the buildings, sometimes in different styles than the original, in order to adapt the building to the new needs of the user. Still, as they formed part of the original monument and its evolution, to a certain extent, these changes can still be considered minimal and today, all these different traces from the different time periods would be considered equally, or at least reasonably, important in describing the evolution of the monument and would therefore be preserved in order for the monument to keep its historic value. This philosophy also constitutes a reaction to the stylistic restorations carried out during the 19th century as will be shown in the following paragraphs. Generally, the more traditional past interventions, repairs and alterations of buildings are considered more valuable or significant because often they were called for by the continuous use of the building, even if the function itself was sometimes changed (Figure 5). At other times, the changes were requested by building

occupants or owners, with for example the aristocracy, royalty or papacy of a certain time period wishing to establish their own importance and requesting that building, or parts of the building be updated, altered or expanded in the new fashionable style of the era. Still, as these changes were implemented in the spirit of their time, without trying to mimic history or recreate what was never there, they are different from the stylistic restorations of the 19th century. Certainly, the historic and age values associated with these interventions should not be underestimated either, as these changes are often many centuries old and have acquired the right to be considered in their own right.

Figure 5 - Densus Church, Romania. The church was built on the site of a former Roman temple using the ruins of a nearby Roman fortress for construction material. While the building has seen a number of alterations throughout time, the church is considered the oldest one in Romania and South-Eastern Europe and is highly valued.

3.2.2 Conservation of ruins or the cult of the artifact

A different approach to minimal intervention refers to the idea of treating the building as an artifact and applying the same rules to it that we would to a ruin or a famous painting. This approach is closely connected to issues such as authenticity and processes such as anastylosis.

Anastylosis was first applied to antique ruins from ancient Rome or Greece, and later also to medieval ruins of castles and churches, and it constitutes perhaps the first example of a minimal intervention when actually undertaking a restoration/conservation project. It consists of using only as much new material as is necessary to put the separate pieces back together, while making the new material clearly distinguishable from the original. While anastylosis is not, in itself, a minimal intervention approach to conservation (true minimal intervention in the case of ruins or artefacts consisting of leaving these remains undisturbed or buried as the case may be), in order to be successfully performed, anastylosis calls for a very careful use of the minimal intervention principle. Examples include the modern restoration of the Parthenon or the restoration of the Arch of Titus in the 19th century. This approach stresses the value of antiquity (Riegl, 1984), and is also connected to national significance, especially in places such as modern Italy and Greece. These countries' connections with the ancient Greeks and Romans and the intrinsic value of their ancient ruins has doubtlessly helped create a strong national identity during the height of the nation-state formation period. Certainly, in time, other countries have seen the remains of their past used for nationalistic purpose and, especially over the 19th century, ancient and medieval ruins (secular, religious or military) have contributed to the nation building of many countries

throughout Europe. These ruins and historic monuments are seen as old, valuable, untouchable traces of a bygone past that is important but is never coming back (see for example Ruskin and Morris's work). The buildings are therefore seen, and conserved, as artifacts and also as documents, that tell a story in themselves and should not be touched.

As mentioned above, this approach is also closely connected to the idea of authenticity, especially in what regards the respect for the original material. The value of these types of monuments lies just as much in their form and overall aesthetics as in the patina they acquired over centuries of life, but also in what Ruskin refers to as the sacrifice of the original builders and craftsmen and the life that they instilled into these monuments. Therefore, preserving this original fabric with minimal changes becomes of the outmost importance.

It is also important to note however that the same weighing scale does not apply to two objects in the same way, or even to the same object, depending on where it is on its life's timeline. For example if an owner changes a broken window to his century home it is called a repair. However, if the same owner chooses to designate his house and later, after designation, decides to replace the same window than it is no longer simply maintenance or repair, it is rehabilitation, or even restoration and the older, and rarer the building type the more discussion any repair is likely to spur. This difference is likely related to a difference of perception in terms of value and influence of the object – is it only valuable for its owner and/or immediate users or does it have significance for the wider community? Generally speaking, it is to be assumed that the more the number of stakeholders increases, and the more rare or unique an object becomes, the more the

focus will be placed on the object's conservation, and the more complex the decision-making process relating to the object's use or rehabilitation will become.

3.2.3 Reactionary – in opposition to Stylistic Restorations

The Unity of Style doctrine developed in the 19th century by Pugin and Viollet-le-Duc caused intense reactions by those who opposed this type of intervention such as Ruskin and Morris. The reaction to the '*Unity of Style*' doctrine can be seen as far as half a century later in the drafting of the Athens and Venice Charters. The idea that restoration could be done by bringing the monument to a coherent state that it may never have had at all, of the restorer presuming to substitute the original builders and take decisions "as they would have" caused intense debates. This can be considered the beginning of the discussion on authenticity and layers of value. Just as Boito (who tried to reconcile the two diverging doctrines, interventionist and anti-interventionist) both Charters state that all layers of a building, dating from different periods of time must be kept, as they reflect the history and evolution of the building. This statement can be seen as both a direct reaction to the '*Unity of Style*' doctrine and the beginnings of advocating for minimal intervention and authenticity.

Considering the time when this discussion started, at the height of the romantic currents, we also notice, particularly in thinkers such as Morris or Ruskin, a strong affinity and passion for things such as patina, the picturesque of ruins, or the ivy covered masonry wall. This also contributes to a certain desire of keeping things as they are, of letting the buildings die a natural death, of not intervening, or intervening only to the extent of slowing down decay, as temporarily stabilizing the ruins.

3.2.4 Reactionary – industrial revolution

At the same time, the discussions mentioned above were taking place at the dawn of the '*age of the machines*' and in full period of the revival styles as well as of the Arts and Crafts movement.

Therefore, we see this evident in two different ways: (1) first, as a resistance to using new technologies and techniques to restore and consolidate existing buildings, such as using iron or steel to reinforce buildings, or using concrete to fill in and repair missing parts (as, for example, Balanos used when restoring the Parthenon), and (2) second, as a certain fear and distrust of the new technologies, fear that the whole world as we know it is coming to an end, and that all the buildings and monuments of our past are never coming back, to remain just the relics of that beautiful, picturesque past. This was also coupled with a certain lack of appreciation of the new architectural and engineering forms created using the new technologies.

3.2.5 Minimal intervention and new technologies

Ironically, the relation between conservation and technology was not a linear one. If someone like Morris or Ruskin would have been distrustful of the new technologies and against using them in conservation work, a great many of their contemporaries believed very strongly in the possibilities of these new technologies (such as Viollet-le-Duc, Pittakis or Balanos). This is also reflected in the drafting of the Athens Charter where the use of new technologies is encouraged. Unfortunately, this trust and excitement were not backed by experience and thorough testing, and as many cases have since shown, sometimes the results of using iron clamps or concrete when performing repairs (Figure 6) has proven catastrophic for many monuments, even for some as high-status as the Parthenon. This eventually led to the revisiting of the conservation principles during

the Venice Charter and the recommendation that (a) traditional materials and technologies be used wherever possible when undertaking conservation, and (b) new materials should only be used where the traditional ones do not prove feasible and only if they can be backed by experience and thorough testing and research. This again, can be associated with a larger importance being given to minimal intervention, as the use of traditional materials and techniques would generally have less of an impact on the overall aspect and character of a building than for example replacing its structure with a steel one.

Figure 6 - Effects of improper use of modern techniques/materials in conservation work. (a) iron inserts causing stone cracks and spalling; (b) failed cement parging on historic masonry wall.

Moving forward in time, four or five decades after the *Venice Charter*, new technologies have yet again started to become a focus in conservation and this can be seen in many shapes and sizes in the field today, some with positive and some with negative consequences. Materials conservation is discussed in more detail in chapter 5.6.

However, it is important to note here that some of the new materials developed are sometimes overestimated or insufficiently researched and tested prior to being applied in conservation work. Even though any intervention will have an impact, to some extent, on the fabric and authenticity of the building, and sometimes, it can even change the original aspect of the building, some interventions may be more compatible than others with respect to the existing material or structure (e.g. when repairing stone masonry with cement-based pargings, replicating missing details in restoration mortars or consolidating the masonry with metal ties). That is to say, that while the intervention may appear to be minimal, and may fix the problem area but because of a lack of compatibility between the two materials (e.g. applying a cementitious layer on a masonry wall that does not allow the wall to breathe properly, or the use of resins and consolidants both for masonry and for wood structures), the repair may fail in the area immediately adjacent, or sometimes in areas apparently unrelated, farther away from the original deterioration area.

3.2.6 Minimal intervention and the crafts

The use of new materials and techniques in heritage conservation can also lead to a loss of existing knowledge on traditional techniques and materials. If the discussion is extended to the broader field of heritage wherein intangible values, traditions and customs are just as important, if not more so, than the authenticity of the material fabric of a building, it is important to consider what impact the use of new technologies, and complete reliance on them have on traditional crafts and skills such as carpentry or woodworking, stone carving or tile making. When considering minimal intervention in this context, if the material fabric is to always take precedence and if factors such as schedule and cost continue to be some of the major driving forces during conservation

projects, sooner or later, these intangible aspects that constitute a significant part of mankind's heritage – the traditional crafts and skills – will inevitably be lost.

The systematic, cyclical, dismantling and rebuilding of Japanese temples as a method of conserving and repairing them, spurred significant discussions on the issues of authenticity in the context of the *World Heritage Convention* and ultimately led to the drafting of the *Nara Document on Authenticity*. Perhaps, from the point of view of conserving traditions, some would argue that this approach is more authentic and more of a minimal intervention than most of the western practices of constantly patching things up and using new materials and mechanization to implement them.

What constitutes a valid principle for anastylosis, the idea to use no more new material than absolutely necessary to put together the existing ancient parts, and make the new material visible, may not work as well in conserving a 19th century building or the vernacular heritage and it is important to consider what role the crafts would play here.

It should be seen as equally important to maintain our crafts, to intervene to the minimum in their disappearance, and if we do intervene in a historic building to use, as far as possible, the same principles, techniques, materials and crafts as were used to build it. This is a point that is briefly touched on in the *Venice Charter* but perhaps not to the degree necessary (article 10: “where traditional techniques prove inadequate, the consolidation of a monument can be achieved by the use of any modern technique [...] the efficacy of which has been shown by scientific data and proved by experience”).

In the end, it is important to note, as will be discussed in chapter 6, that any intervention that we perform on a monument, even the decision to not intervene, to keep something, has an effect on the long term and can be considered an intervention. Any repair and conservation work, any stabilization or consolidation of a building, any repointing of mortar or impregnating of wood is both an irreversible intervention and an action that results in a loss of authentic, original material fabric. In this sense, we cannot say that we are preserving a building as the building and its materials are not static, and all of our interventions (or non-interventions), as well as those of the ones before and after us, are changing it.

As minimal intervention can be seen as a principle very much derived from the Euro-centric view of heritage, this bias is still visible today in how the principle is understood and applied and, to a certain extent, it can be argued that the minimal intervention approach to heritage conservation privileges the same Euro-centric, material focused view of heritage. Non-European theories and responses to this issue such as the Nara or Burra Charters or the Declaration of San Antonio are slowly starting to change this, however, these changes are slow to be implemented. These Charters are discussed in more detail in the following chapter to better illustrate the evolution of heritage conservation theory over the past half a century.

4. The minimal intervention principle in conservation Charters, standards and guidelines

4.1 International Context

The following chapter seeks to give an overview of conservation legislation starting with the international level and concluding with the North American situation. Relevant national and international Charters and Declaration have been analyzed in order to determine how the principle of minimal intervention is represented, if at all, in these documents, starting with the *Athens Charter* of 1931 and ending with the 2011 *Paris Declaration on Heritage as a Driving Force for Development*. The key recurring ideas that this review showed are:

- (a) There are no clear definitions of minimal intervention, in fact there are only a handful of documents that mention the principle by name, though most imply it;
- (b) Even when the principle is named it is seldom defined, and when it is defined it is often applicable to a very narrow field;
- (c) One of the most common contexts in which the idea of minimal intervention seems to appear is the one relating to adaptive re-use and the changes required to maintaining buildings functional, or changing their use;
- (d) Questions of integrity, authenticity and preserving all layers of history also appear frequently in the documents analyzed;
- (e) Some discussion about the principle of minimal intervention appears in the context of archaeological remains and how to go about preserving them;
- (f) Approaches to using traditional or modern materials and techniques are also addressed; and

(g) Last but not least, a significant part of the documents address issues relating to urban planning, design, and legislation which can be seen as advocating for a minimal intervention approach.

All of these aspects are discussed in more detail below.

4.1.1 Defining minimal intervention

The Athens Charter (1931) states that “historical sites are to be given strict custodial protection”. Neither ‘historic sites’ nor ‘custodial protection’ are clearly defined in the Charter. However, article 6 goes on to say that “in the case of ruins, scrupulous conservation is necessary, and steps should be taken to reinstate any original fragments that may be recovered (anastylosis), whenever this is possible”. With regard to other monuments, the Charter only recommends “a thorough analysis [...] of the defects and the nature of the decay of these monuments” before conducting any work and recognizes that “each case needed to be treated individually”.

The Australian ICOMOS Charter for Places of Cultural Significance or The Burra Charter (1999 version) – which introduced and elaborated the notions of the spirit of place, values and statements of significance – is also one of the first documents to introduce a more defined notion of minimal intervention, though it does not use that name specifically. It discusses things like minimal change, minimal or minimizing impact, but never actually uses the phrase minimal intervention. The Charter advocates for a cautious approach of changing as much necessary to care for the place and to make it useable, but otherwise change it as little as possible in order to preserve its cultural significance. These changes should not distort the physical fabric nor be based on conjecture. Article 5.2 also advocates the use of caution in conserving places as the

understanding of cultural significance may change in time. That is to say, that the approaches used in conserving a place today should also make it possible for a different type of intervention in the future, if the interpretation of the place's cultural significance changes.

In discussing levels of intervention, article 2.4 states that “places of cultural significance should be safeguarded and not put at risk or left in a vulnerable state” which can be seen as another way of saying that non-intervention is not generally acceptable. However, article 14 clearly states that “there may be circumstances where no action is required to achieve conservation”. Perhaps it is article 15.1 that best clarifies this by stating that the amount of change to a place depends on the cultural significance of the place and that when change is being considered, one should opt for the option which minimizes the loss of cultural significance. Nevertheless, article 23 provides another exception: “In some cases, continuing a significant use or practice may involve substantial new work”.

Another interesting point made in the *Burra Charter* is made in article 17: “Preservation is appropriate where the existing fabric or its condition constitutes evidence of cultural significance, or where insufficient evidence is available to allow other conservation processes to be carried out”. This can be seen as a different way of advocating for a minimal intervention approach – maintain intervention to a minimum when you do not know enough about the place. However, article 28 of the Charter also advises that “disturbance of significant fabric for study, or to obtain evidence, should be minimized. Study of a place by any disturbance of the fabric, including archaeological excavation, should only be undertaken to provide data essential for decisions on the

conservation of the place, or to obtain important evidence about to be lost or made inaccessible.” Such investigations should minimize disturbance of significant fabric.

Article 4 of the *Washington Charter for the Conservation of Historic Towns and Urban Areas* (1987) states that “conservation in a historic town or urban area demands prudence, a systematic approach and discipline”. However, the same article also cautions that a rigid approach should be avoided since sites vary on a case by case basis, and that no fixed recipes can be given for conservation.

The Principles for the Preservation of Historic Timber Structures (1999) represent one of the first Charters to mention the phrase ‘*minimal intervention*’. Article 6 states that “minimum intervention in the fabric of a historic timber structure is an ideal. In certain circumstances, minimum intervention can mean that their preservation and conservation may require the complete or partial dismantling and subsequent reassembly in order to allow for the repair of timber structures”. In principle, as much as the existing material should be retained and non-destructive testing methods should be use for diagnosis. Proposed intervention should: ”follow traditional means; be reversible [...] or at least not prejudice or impede future conservation work [...] and not hinder the possibility of later access to evidence incorporated in the structure”. The Charter goes on to give very specific instructions on type of wood to be used, and their recommended characteristics, types of techniques, construction technologies and materials. These all should, as far as possible be compatible and/or similar to the original ones, and the use of contemporary materials and techniques such as epoxy resins or steel reinforcement is cautioned against stating that these should only be used if their durability and behaviour have been satisfactorily proven over a significant period of time.

The Charter on the Built Vernacular Heritage (1999) also advocates for a cautious approach in any physical work on vernacular structures. While acknowledging that change in vernacular architecture is unavoidable it is argued that new materials introduced should “maintain a consistency of expression, appearance, texture and form throughout the structure and a consistency of building materials”.

The Krakow Charter (2000) states that conservation work on archaeological finds should be based on the principle of minimum intervention. However, it does not define the principle, only mentioning that conservation should be performed by professionals and that the methodology and techniques used should be strictly controlled. The Charter later goes on to say that any intervention “should respect the original function and ensure compatibility with existing materials, structures and architectural values.”

The Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage (2003) discuss performing conservation in a similar way to the steps performed in medicine: anamnesis, diagnosis, therapy and control. It argues that minimal impact on the architectural heritage can be generally achieved by the repetition of these steps in an iterative process. Further, it states that “no action should be undertaken without having ascertained the achievable benefit and harm to the architectural heritage” and that even urgent solutions, “required to stabilize the structure as it is being excavated, should not compromise the complete building’s concept form and use”. The Principles, in article 3.1 state that “therapy should address root causes rather than symptoms”. As this principle is not explained further, it is difficult to ascertain how far in treating root causes one can go, and what effect and relationship this type of intervention can have on issues such as authenticity or historic fabric, particularly

in respect to fixing design flaws which contribute to the structure's deterioration. In a different article, 3.5, the Principles state that intervention should be kept "to the minimum to guarantee safety and durability with the least harm to heritage values" while article 3.8 advocates, in the cases when the benefits and risks of an intervention may be difficult to determine, an "an incremental approach, starting from a minimum level of intervention, with the possible subsequent adoption of a series of supplementary or corrective measures".

The Paris Declaration on Heritage as a Driver for Development (2011) while not addressing minimal intervention directly gives some definitions which can be applied to it as well: "adapt new uses and functions to existing heritage, rather than the reverse"; and "adapt methods of performance assessment and analysis of structures, thermal properties and safety to heritage requirements, and not vice versa". These comments can be seen as a way of privileging fabric at the expense of people, to a certain extent. While it is certainly desirable to use flexible, adaptable buildings codes, for example, that take into account the innate qualities of a building, at the end of the day, the safety and even the usability of a building should perhaps take precedence. This should be even more so the case in a document that discusses heritage as a driver for development, wherein it is supposed that the focus would be placed more on the persons and on how heritage can be used to help develop and empower local communities. Further, in talking about tourism, the Declaration gives a sort of declaration of how to achieve a minimal intervention approach in managing tourism: "to develop management tools for collecting data on tourism, for the evaluating of the role of heritage and its enhancement in the context of tourism development; to assess the cost of the degradation of heritage values and heritage

assets; to ensure the long term preservation of the cultural and economic resource; to encourage heritage, tourism and development impact assessments; to develop training in responsible tourism management” and “to establish methods to achieve the fair distribution of heritage tourism-related revenues, between the costs of conservation and of heritage management, local communities, and local, national and international tourism companies”.

4.1.2 Adaptive re-use and minimal intervention

Article 1 of the *Athens Charter* (1931) recommends that “the occupation of buildings, which ensures the continuity of their life, should be maintained but that they should be used for a purpose which respects their historic or artistic character”. While this statement is not as clear as those in subsequent Charters such as the *Venice and Burra Charters*, it is important to note it for two reasons. First, it recognizes the use value of monuments and the role it play in helping ensure the survival of heritage properties, and second, while recognizing this importance it also starts placing limits on how this use should be maintained.

The Venice Charter (1964) goes one step further. Article 5 states: “the conservation of monuments is always facilitated by making use of them for some socially useful purpose. Such use is therefore desirable but it must not change the lay-out or decoration of the building. It is within these limits only that modifications demanded by a change of function should be envisaged and may be permitted”. This can be considered as the first place to talk about what we would today refer to as adaptive re-use, social value and minimal intervention. While none of these phrases are directly formulated, the intention is clear: social value of monuments is important, but it is subordinated to the

historic, artistic and aesthetic values of the building, and adaptive re-use should only be conducted using a minimal intervention approach. As it will be seen in the following pages, the discussion on the relationship between adaptive re-use and minimal intervention is prevalent in most of the Charters and guidelines drafted for the past five decades. *The Declaration of Amsterdam* (1975), for example states that it is important to afford functions to buildings which “whilst corresponding to the needs of contemporary life, respect their character and ensure their survival”.

The Burra Charter (1999) in article 1.11 states that “compatible use means a use which respects the cultural significance of a place. Such a use involves **no, or minimal, impact** on cultural significance”. Article 7.2 further states that “New use of a place should involve minimal change, to significant fabric and use; should respect associations and meanings; and where appropriate should provide for continuation of practices which contribute to the cultural significance of the place”. Articles 21.1, 21.2 and 22.1 complete this argument, and the argument for minimal intervention by stating that adaptation is only acceptable if it has a “minimal impact on the cultural significance of the place” and that it should “involve minimal change to significant fabric, achieved only after considering alternatives”. Further, additions to the place may only be acceptable if it does not “distort or obscure the cultural significance of the place, or detract from its interpretation and appreciation”.

Other Charters addressing the idea of adaptive re-use include: *the Charter on the Built Vernacular Heritage* (1999) which states that adaptations should “respect the integrity of the structure, its character and form while being compatible with acceptable standards of living”; *the Charter of Krakow* (2000) which asks that additions to a building reflect contemporary architecture;

4.1.3 Archaeology and minimal intervention

The principle of minimal intervention is, in a sense, highly connected to archaeology and the protection of ruins, as can be seen in a number of Charters. *The Athens Charter* (1931), for example, in article 6 mentions that “when the preservation of ruins brought to light in the course of excavations is found to be impossible” they should be “buried, accurate records being of course taken before filling-in operations are undertaken”. *The Venice Charter* (1964) also states that the reconstruction of ruins should be ruled out a priori and that only anastylosis of archaeological remains can be permitted. “The material used for integration should always be recognizable and its use should be **the least** that will ensure the conservation of a monument and the reinstatement of its form” (article 15). While this statement does not refer to the principle directly, anastylosis in this context can be seen as one of the first forms of minimal intervention.

The Charter for the Protection and Management of the Archaeological Heritage (1990) also states that “provision should be made for the temporary protection of unprotected or newly discovered sites and monuments until an archaeological evaluation can be carried out”. In terms of gathering information about archaeological remains, investigations “should not destroy any more archaeological evidence than is necessary for the protectional or scientific objectives of the investigation. Non-destructive techniques,

aerial and ground survey, and sampling should therefore be encouraged wherever possible, in preference to total excavation”. On the other hand, excavations should always be carried out “on sites and monuments threatened by development, land-use change, looting, or natural deterioration”. Only in exceptional cases, unthreatened sites may be excavated “to elucidate research problems or to interpret them more effectively for the purpose of presenting them to the public” and these excavations must be partial, “leaving a portion undisturbed for future research”.

The Joint ICOMOS – TICCIH Principles for the Conservation of Industrial Heritage Sites, Structures, Areas and Landscapes (2011) also recognize that “alternative and adaptive use is the most frequent way and often the most sustainable way of ensuring the conservation of industrial heritage sites or structures”. However the document cautions that new uses should respect significant original historic material, components and circulation or activity patterns.

4.1.4 Authenticity and minimal intervention

The Venice Charter (1964), in article 3, when discussing the purpose of conservation, states that the intention is to preserve the monuments no less as works of art than as historical evidence. The preamble of the Charter even makes reference to the duty of safeguarding monuments for future generations and handing them down “in the full richness of their authenticity”.

The Dresden Declaration on the Reconstruction of Monuments Destroyed by War (1982) notes the increased interest in (and the influence that wartime destruction and subsequent reconstructions have had on) preserving “the original substance of the monument [...] which, in all those components which make it worthy of being

recognized as a monument, has grown through the ages, and which, by virtue of its authenticity, confirms the origins of the monument and its historical evolution up to the present day”. *The Dresden Charter* also argues that “in the restoration of monuments destroyed by war special care should be taken that the historic development up to the present time can be traced” which is to say that reconstructions should be made distinguishable and not pretend to be part of the original building.

The Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage (2003) cautions that “value and authenticity of architectural heritage cannot be based on fixed criteria because the respect due to all cultures also requires that its physical heritage be considered within the cultural context to which it belongs”.

The Nara Document on Authenticity (1994) developed with the purpose of clarifying the notion of authenticity in the context of World Heritage Sites stresses that when defining authenticity one needs to take into account the different social and cultural values of the sites. It discusses the relativity of the authenticity concept and stresses the importance of “respect for other cultures and all aspects of their belief systems” further arguing that “responsibility for cultural heritage and its management belongs, first, to the community that has generated it, and subsequently to that which cares for it”. The document also discusses values and the credibility of information sources arguing that “our ability to understand these values depends, in part, on the degree to which information sources about these values may be understood as credible or truthful”. Ultimately, the document states that the credibility of information sources can vary significantly from culture to culture and even within the same culture thus making it

impossible to base judgments of values and authenticity within fixed criteria. Instead, the document argues that heritage properties should be considered within their specific cultural contexts, which leads to recognizing that the authenticity of different places may be linked to significantly diverse sources which may include: “form and design, materials and substance, use and function, traditions and techniques, location and setting, and spirit and feeling, and other internal and external factors”. In the context of minimal intervention, this new understanding of authenticity shifts the focus from conserving only the material fabric of buildings to ascribing more importance to the non-material aspects of places. This in turn leads to an increased relativity of the principle of minimal intervention, as will be discussed further in chapter 5.

4.1.5 Integrity and maintaining the layers of all time periods

Article 1 of the *Athens Charter* (1931) notes the general tendency to abandon complete restoration projects but when restoration appears to be indispensable, it “recommends that the historic and artistic work of the past should be respected, without excluding the style of any given period”. It also states, in article 6 that “the removal of works of art from the surroundings for which they were designed is, in principle, to be discouraged”. Article 8 of the *Venice Charter* (1964) makes the same reference, stating that “items of sculpture, painting or decoration which form an integral part of a monument may only be removed from it if this is the sole means of ensuring their preservation”.

When the *Venice Charter* (1964) addresses the idea of restoration, there is a significant difference between the French and English versions. Article 9 of the French version notes that “La restauration est une opération qui doit garder un caractère

exceptionnel” whereas the English version only states that “The process of restoration is a highly specialized operation”. Both versions (as numerous other subsequent Charters) acknowledge that restoration must stop where conjecture begins and that “the valid contributions of all periods to the building of a monument must be respected, since unity of style is not the aim of a restoration”. Further, “the revealing of the underlying state can only be justified in exceptional circumstances and when what is removed is of little interest and the material which is brought to light is of great historical, archaeological or aesthetic value, and its state of preservation good enough to justify the action”.

The Florence Charter on Historic Gardens (1981) recognizes that “restoration work must respect the successive stages of evolution of the garden concerned. In principle, no one period should be given precedence over any other, except in exceptional cases” (article 16). *The Burra Charter* (1999) also addresses this issue in article 15.4: asking that “the contributions of all aspects of cultural significance of a place should be respected”. *The Charter on the Built Vernacular Heritage* (1999) mentions the same aspect: “conformity of all parts of a building to a single period will not normally be the goal of work on vernacular structures”. *The Krakow Charter* (2000) states that work on historic buildings must pay full attention to all the periods that are represented in the building. *The Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage* (2003): “each intervention should, as far as possible, respect the concept, techniques and historical value of the original or earlier states of the structure and leaves evidence that can be recognized in the future” and “the removal or alteration of any historic material or distinctive architectural features should be avoided whenever possible”.

4.1.6 Traditional versus new materials and techniques

The Athens Charter (1931) accepts and even advocates for the use of new materials and “all the resources at the disposal of modern technique” for the consolidation of ancient monuments and recommends their use especially in “cases where their use makes it possible to avoid the dangers of dismantling and reinstating the portions to be preserved”. However, as subsequent experience has shown, and more recent Charters and guidelines recognize, the use of new materials and techniques needs to be judiciously researched, tested and justified before use in any restoration or conservation work. While the approach described in the *Athens Charter* may on first glance appear a minimal intervention one – better to use new materials than to be obliged to dismantle and rebuild the building, as these new materials were often insufficiently tested for durability and/or compatibility with the existing, historic material, it was not uncommon that this approach led to more harm than good on the long run leading to more loss of historic material.

The Venice Charter (1964) begins to address this issue when, in article 10, it argues for the use of traditional techniques first, only allowing the use of modern techniques “the efficacy of which has been shown by scientific data and proved by experience”. *The European Charter of the Architectural Heritage* (1975), in article 6, also addresses the fact that “misapplied contemporary technology and ill-considered restoration may be disastrous to old structures” and it further urges that “traditional crafts should be fostered rather than allowed to die out”. *The Charter on the Built Vernacular Heritage* (1999) further states that “the continuity of traditional building systems and craft skills associated with the vernacular is fundamental for vernacular expression, and essential for

the repair and restoration of these structures” and advocates that these skills be retained, recorded and passed on to new generations.

The Krakow Charter (2000) also states that “any new materials and technologies should be rigorously tested, compared and understood before application” and that when new techniques are used they “should be continually monitored in the light of the achieved results, taking into account their behaviour over time and the possibility of eventual reversibility”. With respect to traditional materials and techniques, we should continue to improve our knowledge of them and maintain them as they are “in themselves important components of cultural heritage”.

4.1.7 Design, legislation, urban planning and minimal intervention

The Athens Charter (1931) is also the first one to make a mention of what could be deemed minimal intervention in terms of urban design. Article 3 states that in building new constructions “the character and external aspect of the cities in which they are to be erected should be respected, especially in the neighbourhood of ancient monuments, where the surroundings should be given special consideration”. The Charter also mentions that certain groups of buildings and “particularly picturesque perspective treatment should be preserved”. While these statements can be seen as fairly broad, the following paragraph gives is much stricter. It recommends “the suppression of all forms of publicity, of the erection of unsightly telegraph poles and the exclusion of all noisy factories and even of tall shafts in the neighbourhood of artistic and historic monuments”. Again, the phrase minimal intervention, or any variations of it are never mentioned in the text of the Charter, however, its meaning could not be clearer in advocating for the minimal impact of urban infill in historic environments.

The Venice Charter (1964) also notes the important of setting, its article 7 stating that “the moving of all or part of a monument cannot be allowed except where the safeguarding of that monument demands it or where it is justified by national or international interest of paramount importance.” In terms of design, article 13 of the Charter states that additions can only be allowed if they “do not detract from the interesting parts of the building, its traditional setting, the balance of its composition and its relation with its surroundings”.

The European Charter of the Architectural Heritage (1975), while advocating for integrated conservation, and stating that conservation should be “one of the first considerations in all urban and regional planning” also mentions that “integrated conservation does not rule out the introduction of modern architecture into areas containing old buildings provided that the existing context, proportions, forms, sizes and scale are fully respected and traditional materials are used”. *The Declaration of Amsterdam* (1975) is also the first to address the rigidity of legal and planning tools in terms of our built heritage. It states that “as far as possible, the application of building codes, regulations and requirements should be relaxed to meet the needs of integrated conservation”. On the other hand, in terms of urban planning, it states that is of highly important to “draw up legislation subjecting new building to certain restrictions with regard to their volume and dimensions (height, coefficient of utilization etc.) that will make for harmony with its surroundings” and that planning regulations should “should discourage increased density and promote rehabilitation rather than redevelopment”. Neither what is understood by density or by redevelopment is clearly defined in the

Declaration; however it is a clear mention of minimal intervention in terms of the setting of sites.

The Washington Charter (1987) emphasizes that in new construction or adaptive reuse “the existing spatial layout should be respected, especially in terms of scale and lot size”. However, the same article goes on to say that “the introduction of contemporary elements in harmony with the surroundings should not be discouraged since such features can contribute to the enrichment of an area”. The Charter is much stricter though when it comes to traffic and pollution stating that “traffic inside a historic town or urban area must be controlled and parking areas must be planned so that they do not damage the historic fabric or its environment. When urban or regional planning provides for the construction of major motorways, they must not penetrate a historic town or urban area, but they should improve access to them” (articles 12-13). The following article also advocates that historic towns “should be protected against natural disasters and nuisances such as pollution and vibrations in order to safeguard the heritage and for the security and wellbeing of the residents”.

The Charter for the Protection and Management of the Archaeological Heritage (1990) argues that land use must be “controlled and developed in order to minimize the destruction of the archaeological heritage”. Article 3 of the Charter advises that archaeological heritage impact studies be carried out before commencing development and that any “development schemes should be designed in such a way as to minimize their impact upon the archaeological heritage”.

The Burra Charter (1999) also states that “new construction, demolition, intrusions or other changes which would adversely affect the setting or relationships are

not appropriate” (article 8) and that new work can be considered as sympathetic if “its sitting, bulk, form, scale, character, colour, texture and material are similar to the existing fabric” but discourages imitation.

The Xi'an Declaration on the Conservation of Setting of Heritage Structures, Sites and Areas (2005) states that “cultural traditions, rituals, spiritual practices and concepts as well as history, topography, natural environment values, use and other factors contribute to create the full range of a setting’s tangible and intangible values and dimensions”. In order to protect this setting, it advocates that “significant skylines, sight lines and adequate distance between any new public or private development and heritage structures, sites and areas are key aspects to assess in the prevention of inappropriate visual and spatial encroachments or land use in significant settings”. The Declaration cautions that “managing change to the setting of heritage structures, sites and areas need not necessarily prevent or obstruct change” but it proposes establishing qualitative and quantifiable indicators “to assess the contribution of the setting to the significance of a heritage structure, site or area”, indicators that “should cover physical aspects such as intrusion on views, skylines or open spaces, air pollution, sound pollution, as well as economic, social and cultural dimensions”.

The Paris Declaration (2011) is quite strict in recommending that, in order to preserve space, the following should be done: preserve open spaces; “maintain rural landscapes and the organization and scale of their agriculture and forests”; “conserve indigenous plant and aquatic heritage”; “protect geological and archaeological heritage, groundwater and ecosystems”; “maintain regional and local communication networks (railway heritage, roads, navigable waterways)”; preserve rural heritage and “strictly limit

urban sprawl and place conditions on the right to build, stipulating that development should respect the historic landscape and traditional settlement patterns”.

4.1.8 Discussions and conclusions to international legislation

As mentioned above, the principle of minimal intervention is seldom mentioned by name in most of these Charters and even when the principle is directly referred to it is seldom actually defined, for example in terms of what this minimal intervention approach should actually be applied to, what types of heritage, what aspects of a certain type of heritage, in what context. However, upon close inspection one can observe many instances when references to this principle are made either directly or in requesting caution, prudence or minimizing impacts. Based on the above review, it can be concluded that minimal intervention is generally required:

a) in conserving archaeological remains. The Charters recommend that in order to ensure the survival of archaeological heritage every measure should be undertaken to protect material discovered during excavations, and what cannot be properly protected or researched at the present time should be buried to limit its degradation. It is also recommended to limit investigation work to that which is strictly necessary and not disturb the entire area of deposits, to ensure that future generations, which may have better technologies will have access to undisturbed deposits, while at the same time ensuring that archaeological investigations are incorporated in development strategies so that no deposits are unknowingly destroyed;

b) in order to preserve the authenticity of buildings. This is to be done particularly through respect for the original fabric of the building, respect for the different layers of history that the building may have acquired, making new interventions distinguishable

and subordinated to the original structure, and by incorporating, as much as possible traditional, or compatible, materials and techniques in the conservation of the building;

c) when conducting adaptive re-use projects. While recognizing the importance of maintaining documents in use, the guidelines agree that changing the function of a building should be done respectfully, choosing a compatible new use for the building, and one that requires as little changes as possible to the building, both on the interior and on the exterior. On a different note, it is also recommended that legislation such as building codes or other such standards be applied in a flexible way that ultimately takes into consideration the inherent qualities of the building and makes the building safe for use, while maintaining required changes to a minimum.

d) during urban planning and when designing new buildings so as not to disturb the existing fabric of historic cities, districts or neighbourhoods, or the setting of important historic monuments. This applies both when designing urban infill in historic areas or contemporary additions to existing buildings, but also when discussing broader land management issues such as traffic control, parking, development directions etc.

As the list above demonstrates, the minimal intervention principle, as illustrated through these Charters and documents seeks to protect the original fabric, use, layers and setting of a monument by attempting to limit changes to these character-defining elements of historic monuments. The impact of heritage conservation doctrines of the 19th century can still be very much seen in a number of the 20th century Charters and legislation discussed above. The focus on heritage fabric, derived from the anti-interventionist school of thought or the strong opposition to stylistic restorations and emphasis placed on authenticity or respect for all the layers and historical periods of an

object are but the more obvious examples of the strong influence of the Euro-centric, 19th century view on heritage on the conservation theory of the past century, particularly in what regards the minimal intervention principle. To a certain extent this view is also present in the conservation theory in non-European countries however changes are gradually starting to occur. The following sub-chapter briefly illustrate the evolution of heritage conservation theory in Canada, as an example of conservation in a non-European context.

4.2 Minimal Intervention in Canada

4.2.1 General Canadian context

The Declaration of Deschambault (1982), while focused on defining and protecting the heritage of Quebec, also gives a very good description of the broader Canadian framework in which heritage conservation is to take place. Thus, this is characterized by “a harsh climate, a vast territory, the relatively recent establishment of a North American civilization that is European in origin, [...] and a particular pattern of human settlement”. Particularly over the past century and half “immigrants from different places have been added to the amalgam of the three peoples” who originally fought over control of this land. Therefore, the country’s “material heritage has been marked [...] by this mixture of cultural traits” as well as by the “spectacular growth of the United States [that] had repercussions of the utmost importance on our economic model and our way of life: massive urbanization, high rate of consumption, establishment of large industrial centres and development of means of transportation for natural, human and energy resources“. “The great distances between population centres and the immensity of the territory”

contribute to further define the Canadian context in which “climate is also, at times, a menace to our architectural heritage and to the remains of former times”, particularly through freeze-thaw cycles. The Declaration concludes this description by stating that “because this culture is of recent origin and only extends over a short span of time, it would be inappropriate to rely solely on chronological classification to determine the relative value of its different elements”.

4.2.2 First Canadian conservation projects and Charters

As described by Cameron (2000) the first conservation projects in Canada were limited to individual or unified groups of buildings, with a single thematic focus, which were restored to the condition of their "original" period of significance, while removing evidence from later periods. This approach lasted well into the second part of the 20th century. Some examples include the reconstruction of the stone locks on the Rideau Canal, the disassembling and reconstruction of the walls at Lower Fort Garry with random insertions of some of the old stone, or the massive reconstruction during the 1970s of the Lower Town of Quebec City where, in an attempt to recreate an eighteenth-century space, the project not only destroyed older archaeological records but also obliterated wonderful examples of early nineteenth-century building (Cameron, 2000).

Only in the 1980s, two documents adapted the principles of the Venice Charter to the Canadian context. *The Declaration of Deschambault* (1982) focused on defining and protecting the Quebec’s heritage, highlighting the importance of public consultation procedures and public participation in the conservation of national heritage. The Declaration stressed the importance of “authenticity in preserving and developing the national heritage, and in passing it on to future generations” arguing that “when only

certain elements of this heritage remain, these must be treated as integral wholes” and that “respect must be shown for the significant contribution of every historical period”.

The Declaration also discussed the importance of maintaining the “continuous use of [...] heritage, without any interruption of occupation” stressing the importance of maintaining cultural properties “accessible and useful”. When new uses are introduced they should be “useful to society” and “compatible with the structure and nature of the buildings, spaces and sites”. At the same time, the new functions must “avoid excessive use and the deterioration that would result from such use”. Further, the Declaration stresses the importance of conserving “as much as possible of the original”, and of avoiding “reconstruction based on conjecture”. Lastly, it addresses the design of contemporary additions which “must be creative works in their own right, [and] have to be integrated and harmonized with the surrounding context in regard to tonality, texture, proportions, pattern of filled and empty spaces, and overall composition”.

The Appleton Charter (1983) drafted by the English speaking committee of ICOMOS Canada one year later, clarified the distinctions between various kinds of interventions (i.e. preservation, period restoration, rehabilitation, period reconstruction and redevelopment) and also called for documentation and analysis before intervention, respect for existing fabric, identification of heritage values, protecting the integrity of the historic fabric and making changes reversible. The Charter also asks for public participation prior to the initiation of any work.

In discussing the activities associated with the different levels of intervention, *the Appleton Charter* talks about maintenance as “a continual activity to ensure the longevity of the resource without irreversible or damaging intervention” and characterizes

stabilization as “a periodic activity to halt deterioration and to put the existing form and materials of a site into a state of equilibrium, **with minimal change**”. It also discusses that “a property should be used for its originally intended purpose. If this is not feasible, every reasonable effort shall be made to provide a compatible use which requires **minimal alteration**”.

While the Charter accepts the idea of providing new, “compatible use which requires minimal alteration” to a space which can no longer serve its originally intended purpose, it also discusses issues such as artifactual value and patina. The Charter states that “sites of the highest cultural significance are to be considered primarily as artifacts, demanding protection as fragile and complex historical monuments”. However, the document does not explain how cultural significance is to be determined therefore it is somewhat unclear which sites should be treated as artifacts and which can be subjected to different conservation approaches. Further, the Charter also mentions patina, stating that it “form part of the historic integrity of a resource, and its destruction should be allowed only when essential to the protection of the fabric” further cautioning that “falsification of patina should be avoided”. While this approach constitutes a clear reference to the idea of minimal intervention, it is interesting to note that it is one of the only Charters to mention patina, and the fact that this is found in the North American context in the late 20th century is perhaps even more surprising. Further, as it will be shown in the following chapter, it is worth mentioning that recent projects undertaken, at least in the Ottawa area, appear to be somewhat less concerned with patina than with most of the other conservation principles discussed above.

Most of the Charters discussed above can be considered as reflective of the modernist way of thinking, and of a certain belief in the universal applicability of conservation principles. However, over the past decade or so, a gradual change has been taking place, towards a more post-modern take on heritage conservation characterized by increasing discussion on issues such as management of change, relativity and the need for a new taxonomy for the field of heritage. Chapter 5 discusses some of these issues and the relationship between them and minimal intervention in more detail.

4.2.3 Standards and Guidelines

After these first documents, in 1994, Parks Canada established its *Cultural Resource Management policy* (C.R.M.) which offered a holistic approach that integrated conservation and presentation and called for the identification of heritage value prior to any other action or activity. This policy set out five principles for the management of cultural resources: value, public benefit, understanding, respect and integrity and it introduced the *Commemorative Integrity Statement* for National Historic Sites, and the *Heritage Character Statement* for Federal Heritage Buildings.

At the turn of the century, in 2003, the first edition of *the Standards and Guidelines for the Conservation of Historic Places in Canada* was created through cooperation initiative between the federal and provincial governments and Parks Canada, with the revised second edition being published in 2010. This constitutes one of the most recent Canadian documents dedicated to the practice of heritage conservation. Of particular interest for this study is Standard 3 which states that heritage value should be conserved “by adopting an approach calling for minimal intervention”. The Standard reads:

“Minimal intervention in the context of heritage conservation means doing enough, but only enough to meet realistic objectives while protecting heritage values. Minimal does not mean, doing little or nothing, or the least possible. In fact, enough intervention to arrest and correct deterioration, meet codes, or introduce new services, can be quite extensive. Determining minimal intervention is a matter of rigorous assessment, options analysis and creativity to identify the intervention that balances technical and programmatic requirements with protecting heritage value.” (Parks Canada, 2000, p. 26)

The Standards recognize that the application of the minimal intervention principle varies depending on the nature the site and on its character-defining elements, giving the example that minimal intervention would not mean the same in the context of a landscape (where substantial replanting may not only acceptable but also necessary), an historic bridge (where ensuring it is able to support current traffic loads, and poses no public safety concerns may require significant structural upgrading) or archaeological sites (where investigations for the purpose of obtaining more knowledge about the site should be done in the gentlest way possible). The Standards also distinguish between how the minimal intervention principle should be applied when undertaking preservation (through maintenance and regular repairs to the building), rehabilitation (limiting new additions or restricting potential changes required by the adaptive re-use of the building) or restoration (balancing the removals and recreations to ensure the preservation of the authenticity of the place).

It is also noteworthy to mention that, as opposed to most of the Charters and documents that have been analyzed above, in chapter 4, which only seldom make direct reference to the notion of minimal intervention, the Canadian Standards, and particularly the Guidelines mention the phrase no less than 38 times. For comparison purposes, the United States equivalent to the Canadian Standards and Guidelines, *The Secretary of the Interior's Standards for Historic Preservation Projects* (1992) never actually mentions minimal intervention by name and makes references to 'minimal changes' or 'minimal impact' only three times.

The US Standards were developed in the mid-twentieth century, when demolition or insensitive alterations were very frequent because of urban renewal and suburbanization. They do call for a minimal intervention approach, particularly in relation to rehabilitation however they do so less evidently than their Canadian counterpart. For example, Rehabilitation Standard number 1 states that "a property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment". Rehabilitation Standard Number 6 further states that "deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence".

4.2.4 Local and provincial legislation

In Canada, constitutionally, the provincial government regulates provincial, municipal and privately-owned land and the federal government manages federally owned land. In terms of heritage conservation this translates, succinctly into provincial legislation for the protection and designation of heritage at the local level, and federal mechanisms for the protection of federally owned buildings through the Federal Heritage Buildings Review Office (FHBRO).

In Ontario, *the Ontario Heritage Act*, first introduced in 1975, provides legal protection for the province's places of cultural value. The Act regulates designating, altering, demolishing or repealing of properties of cultural value which may be individual buildings, groups of buildings (known as heritage conservation districts [HCDs]), or archaeological remains. The Act can be seen as a representation of the *three pillar* approach to heritage conservation developed in 1973 by the Heritage Canada Foundation. This approach consists in:

a) identification of property of cultural value and their designation through inscription into a municipal register of heritage places. This step also requires the identification of heritage attributes for both heritage buildings and HCDs.

b) regulations on how the designation process is to take effect, which alterations can be done with or without a permit and how these are to be conducted, and demolition and repealing of designated properties. For HCDs this also requires creating a heritage conservation district plan which must include: a statement of objectives to be accomplished by the designation, the specific values of the district that need to be

protected, a description of the heritage attributes, the types of alterations can be done without a permit and other policy statements, guidelines and procedures.

c) providing incentives and financial support for designated buildings through passing municipal by-laws for the creation of various grants, loans and other financial incentives in order to promote the protection, restoration and rehabilitation of heritage buildings.

However, it is important to note that the process described above applies only to the material and built heritage, unlike the legislation in place for the protection of cultural heritage in other provinces. For example, there are no references or provisions made in the Ontario Heritage Act (OHA) for the protection of intangible heritage, cultural landscapes, or the heritage of the First Nations. However, the Provincial Policy Statement in Ontario does provide additional protection for archaeological resources (also covered under the OHA), cultural heritage landscapes (defined as a clearly delimited geographical area of heritage significance which has been modified by human activities and is valued by a community) and natural heritage (including the habitat of endangered and threatened species, significant wildlife habitat, areas of natural and scientific interest, important for their environmental and social values). Still, no provisions are made for intangible heritage and little is discussed about how to go about protecting the heritage of the First Nations. In comparison, the British Columbia *Heritage Conservation Act*, as well as Quebec's *Loi sur le Patrimoine Culturel*, both address the protection of aboriginal peoples while the Quebec legislation also addresses intangible heritage, historical persons and events and collections.

4.2.5 Authenticity and the Spirit of the Place

The last documents analyzed to reflect the current Canadian and North American conservation context are two texts of particular interest to discussing heritage conservation in the 21st century: the 1996 Declaration of San Antonio and the 2008 Quebec Declaration. The *Declaration of San Antonio* was signed by the ICOMOS National Committees of the Americas and addresses the meaning of authenticity in conserving the heritage of the Americas. This document draws on *the Nara Document* on Authenticity and seeks to adapt the principles discussed therein to the American context. One of the key issues discussed is the continuous presence of indigenous in these territories as well as of many other cultural groups and the fact that “no nation in the Americas has a single national identity”. The Declaration generally characterizes the American cultural context as “groups with different histories and identities [which] coexist in the same place and time, share the same cultural manifestations but ascribe different values to them”. Therefore, the document advises that the values of majorities and minorities should both be recognized without “imposing a hierarchical predominance of any one culture”.

Further, the Declaration acknowledges that while for some sites the material fabric may be the principal component of their authenticity (stressing that in this case interpretations achieved through restoration cannot be considered authentic) in other cases, such as for cultural landscapes, “the conservation of overall character and traditions, such as patterns, forms and spiritual value, may be more important than the conservation of the physical features of the site, and as such, may take precedence”. This is important because it is one of the first documents to accept a potential shift from the

focus placed only on conserving the historic, original fabric of buildings to allowing for more consideration to the other values a heritage place might have. In the context of a minimal intervention approach, as it will be discussed in the following chapter, this means that consideration should be given not only to limiting impacts on the tangible aspects of heritage places but also on their intangible aspects. Further, the San Antonio Declaration brings into discussion the idea of social value stating that “the goal of preserving memory and its cultural manifestations must be approached by aiming to enrich human spirituality, beyond the material aspect” and stressing the importance of involving the concerned communities into discussions to achieve a better “understanding and expression of the deeper values of the site as an anchor to their cultural identity”. The document then goes on to discuss dynamic and static sites acknowledging that “their conservation needs, the determination of their authenticity, and their interpretation vary according to their character”. Dynamic sites are described as “the product of many authors over a long period of time whose process of creation often continues today” whereas static sites are seen as those which represent “the concluded work of a single author or group of authors and whose original or early message has not been transformed” or archaeological sites. For dynamic sites, it is acknowledged that some physical changes “associated with maintaining the traditional patterns of communal use of the heritage site do not necessarily diminish its significance and may actually enhance it” whereas for static sites most often “the physical fabric requires the highest level of conservation in order to limit alterations to their character”.

The influence of this document, which represented a significant step forward in broadening the discussion on how to preserve places of significance, can be seen as recently as 2008 in the *Quebec Declaration on the Preservation of the Spirit of Place*. This document addresses the conservation of both tangible and intangible aspects of places of significance, defining the spirit of place as “the tangible (buildings, sites, landscapes, routes, objects) and the intangible elements (memories, narratives, written documents, rituals, festivals, traditional knowledge, values, textures, colors, odors, etc.), that is to say the physical and the spiritual elements that give meaning, value, emotion and mystery to place”. It is recognized that this spirit of place has a plural, dynamic character, being “capable of possessing multiple meanings and singularities, of changing through time, and of belonging to different groups” which is more suitable for today’s globalized world. The Declaration recognizes the importance of intangible cultural heritage and asks that it be “taken into account in all legislation concerning cultural heritage, and in all conservation and restoration projects for monuments, sites, landscapes, routes and collections of objects”.

4.2.6 Conclusions to Canadian and North American legislation

As it can be seen from the Charters and legislation discussed above, a formal discourse on heritage conservation in Canada was somewhat slow to start, and the complex issues of managing a vast territory, with harsh climate and a multitude of different cultures including indigenous peoples have not made the Canadian conservation field any simpler. However, the country has had a significant role in advancing the field in what relates aspects such as authenticity or the importance of the spirit of place. The

paradox, particularly in analyzing the minimal intervention principle, is that at the same time as recognizing the relativity of the notion of authenticity and the importance of considering the different values associated with a place, *the Standards and Guidelines for the Conservation of Historic Places in Canada* also represents one of the documents that advocates more loudly for a minimal intervention approach to conservation. Certainly, the two do not exclude each other, and *the Standards and Guidelines* provide one of the broadest and clearest definitions of the minimal intervention principle from the documents that have been analyzed during this research. However, as the Standards refer particularly to the conservation of historic **places**, their focus, in discussing minimal intervention, remains on the material, physical aspects of the sites discussed and less so on the broader socio-cultural context.

5. Today's context – applying conservation theory into practice. Examples from Ottawa, Canada

5.1 Heritage conservation in the 21st century

As showed in the past two chapters, the minimal intervention principle can be closely associated with the 19th century - early 20th century European context and their specific view on the field of heritage. Further, as most of the international and national Charters and best practice guides discussed in chapter 4 demonstrate, the principle is most often applied in the areas of authenticity, materials conservation, adaptive-reuse and urban design. That is to say the minimal intervention principle is greatly connected to historical monuments in the traditional sense of the word, wherein the building is seen as a historic document whose historic value can only be preserved by preserving the original fabric. However, while traditional historic monuments, such as prehistoric archaeological remains, antique ruins or medieval churches and castles, are still present today, and while they cannot be said to be less important than a century ago, they are less extensive and constitute only a small part of the broader field of heritage today. The heritage field today incorporates not just monuments (be they historic, intentional, non-intentional) and their settings, but also natural sites and cultural landscapes, urban districts and historic centres, underwater archaeology, industrial heritage, vernacular and indigenous sites, and numerous forms of intangible heritage. As Petzet (2010) mentions, conservationists today, have started to avoid the term monument and replace it instead with the term 'place', which according to article 1 of *the Burra Charter* can mean almost anything: "Place means site, area, land, landscape, building or other work, group of other buildings and other works and may include components, contents, spaces and views". These places

are seen as self-defining, dynamic, fluid, and local and do not necessarily have any big heritage assets.

This new, broader heritage field now faces specific challenges and contemporary conservation theory has begun to change in order to address them. Lately, there have been a number of discussions (Araoz, 2010; Loh, 2010) about the fact that the heritage field ought to accept and recognize that change is inevitable and that every conservation decision and any intervention constitute an irreversible change and upon recognizing begin to consciously manage these changes. In this context, as Poullos (2010) suggests, “conservations needs to ‘escape’ from the discontinuity created between the monuments, considered to belong to the past, and the people of the present and also from the attachment to the fabric, and move towards embracing communities’ associations with sites and the continual process of creation of the sites in the context of these associations”.

To summarize, some of the ways in which the field is evolving include (i) recognizing the significance of intangible heritage, and accepting the importance of protecting not just the object but also the ritual, meaning and value behind the object, (ii) recognizing heritage as a process, something that is dynamic and constantly evolving, rather than as something that is static and finite, (iii) managing the social value of heritage, (iv) or integrating conservation in the sustainable development framework. A number of these aspects are discussed in more detail below, focusing specifically on the idea of **values-based conservation** (with particular emphasis placed on the social, use and economic values of heritage), analyzing the ways in which these **values are reconciled and incorporated in conservation work** (e.g. through sustainable

development, heritage based development, or managing living heritage) the relationship between **conservation, sustainability and the environment, materials conservation, and reconciling heritage values with contemporary building standards and legislation**. The main question that is explored in this chapter is: what minimal intervention means in this new framework and how it is or how it can be applied into practice.

5.2 Authenticity

The traditional theoretical framework of heritage conservation is based on the notion that authenticity is non-renewable as it lies in the tangible fabric and on elements of materiality.

This traditional approach is demonstrated to a great extent, for example, in Null's 1985 article discussing restoration, in which she stated that any element of restoration that falsely presents itself as old and authentic "not only devalues the original but also damages it as an historical document". The article asks what intrinsic value can the genuine heritage of the past have if we can create history at will, and argues that a work of art is more than a collection of parts, wherein even the smallest detail or the finishing layer can be crucial to the overall artistic whole. To address the problems associated with the concept of restoration, she introduced the concept of '*mental restoration*' – the idea that the "human mind can grasp the incompleteness of the monument and mentally recognize the whole" further arguing that an incomplete work of art may be understood, but it can never be restored. As the building contains all the information it needs to communicate both to current and future generations, be they professionals or laymen,

Null (just as Ruskin or Morris) saw no actual need for the deception of restoration. Instead, she recommended appealing to the imagination (through means such as writing, theatre, restorations and reconstructions on paper) as a way to recover the past without intervening in the fabric of historic buildings.

In this traditional view of conservation, the history of a building must be preserved, which in turn requires that everything that has been transmitted to the present in the historic building should be retained. Null suggested that the legitimate purpose of restoration is interpretation, not recreation and that ultimately, only the material of the building can be restored and not its artistic value and that, in general, careful restoration should aim to not restore the image of a building rather than to restore its material aspects. Null concluded by advising to always do less rather than more and she quotes Ruskin by saying that when sufficient information is lacking the conservator should seriously consider doing nothing as it is better to let the building die than for it to live as a fake.

This view of heritage and authenticity that has dominated the field for over a century only began to change in the 1990s with the drafting of documents such as the *Nara Document on Authenticity* or the *Declaration of San Antonio*. These documents, as discussed in chapter 4.1.4, introduced a new view on authenticity and, together with other documents, such as the *Burra Charter*, recognize the relativity of the concept of authenticity, and the fact that it can lie not only in the historic fabric of a building but also in other aspects. Some examples, as discussed in the *Nara Document*, include: a site's use, function, location or setting, the traditions and techniques associated with the place, and the overall spirit of the places. Further, as the *Burra Charter* recommends, the broader, cultural context of the place also needs to be taken into consideration when

discussing conservation activities. In discussing living heritage sites, for example, Poulios (2000) argued that for these sites, their authenticity lies in the present, and is associated mostly with the community's intangible connections to the site and is continually created and defined by the site's core community.

In this context, there seem to be no easy answers when discussing how the principle of minimal intervention should be applied in relation to authenticity. It is highly important though to determine in which aspects of the site its authenticity lays, and to ensure that a minimal intervention approach is followed first and foremost in ensuring the protection and survival of that aspect. However, this approach should not be undertaken to the detriment of other aspects of the site or to the site as a whole. With few exceptions, (namely, for the sites where their historic value is either the only value of the place, or, by far, the most important of its range of values) the documentary value of a site should not be considered higher than all the other and care should be taken to preserve the authenticity and continuity of all the other values of the site. If a historic building is deteriorating or has lost its use, a good practice today would be to consider minimal intervention in terms of the environment, and the broader societal context and instead of letting the building 'die an honourable death', to reuse it and give it back to the community. Remaining honest about the adaptations and changes that have been made and taking every care that the original parts of the building are clearly distinguishable should be part of the re-use project, but not necessarily seek to take precedence over making the building useful and valuable to the community again.

5.3 Sustainability and the environment

Ross (2006) argues that heritage conservation is sustainable because it often involves densely developed sites, reduces urban sprawl and reduces demolition (with its associated waste and landfill issues), works with existing buildings and materials, conserves embodied energy and reduces the need for new materials, but also because it contributes to preserving communities by developing a sense of local community identity, pride and cohesion. From an economic point of view, heritage conservation also helps retain or create high-skilled jobs, develops the market value of existing buildings and neighborhoods, encourages small-scale diversified uses, and contributes to economic development and cultural tourism. Powter and Ross (2005) discuss a number of tools that can be used to help assess the environmental impact of design decisions currently available. These include construction and demolition waste calculators, diversion/landfill calculators, building assembly performance calculators, life-cycle optimization, energy performance models, and overall environmental or sustainability rating systems for buildings. However, these tools measure environmental performance based on finite set of criteria and compare them to set standards that are written for new buildings therefore, the benefits of heritage conservation in terms of sustainability and the environment are perhaps not always clear to the general public.

Unfortunately, nowadays, in what regards the built environments, sustainability seems to often take precedence over conservation. It leads to destroying heritage buildings and their associated values in the name of constructing more efficient buildings. This is more so the case for building or places which lack a clear definition of what exactly character defining elements should be protected. As Stovel (2011) mentioned, a

clear statement of the protected heritage values and attributes, accompanied by a translation of those values and attributes into relevant indicators is therefore required. For example, in order to maintain heritage values when discussing making an existing building more sustainable it is necessary to define in advance the degree of structural integrity and material retention that must be retained and the degree to which substitution or replacement can be carried out while maintaining important architectural, historic or aesthetic qualities (Stovel, 2011).

However, discussing questions of sustainability and the environment in the context of heritage conservation also raises a number of issues and potential conflicts. While it is starting to be more broadly accepted that an existing building is more sustainable than demolishing it and building a new green building in its place, this can also pose some problems in terms of the reconciling sustainability values with the more traditional principles of heritage conservation. As all of the concepts discussed in this chapter are interrelated, the discussion above on minimal intervention and authenticity, also applies here in a related way. For example it is important to determine what it is that we are trying to minimize the impact on. If we are keeping intervention to a bare minimum on a deteriorated building and conserve as much of the original historic fabric as possible, rather than rehabilitate or re-adapt the building to make it usable again, we are maintaining perhaps the authenticity of the original building and minimizing changes to its historic material, but we are also maximizing the environmental impact by not using an existing building to its full potential and capacity thus encouraging the building of a different structure to house the function the historic building could have housed. This in turn leads to using more resources to build the new construction, more fuel consumption

and carbon emissions, often urban sprawl and suburban developments, and a series of other associated issues. Similar examples can be considered in terms of constructing additions to existing buildings, or accepting urban infill and a certain amount of intensification in historic districts, while ensuring that these new constructions are designed in a compatible way, which complements the existing urban fabric and layout.

5.4 Values-based conservation

Today, it is broadly accepted that heritage is important because of the meanings and uses that people attach to material goods and the values they represent. This modern theory of values in heritage conservation can trace its origins to Riegl who first theorized the many values that heritage can have in his 1903 work – *Der Moderne Denkmalkultus: Sein Wesen Und Seine Entstehung (The Modern Cult of the Monument: Its Essence and its Origins)*. However, the modern values-based approach is largely based on the first *Burra Charter* (1979) which, for the first time, recognized the importance of equally involving the many differing stakeholder groups and their values in the conservation and management of heritage. *The World Heritage Convention* (1972), with its inclusion of both natural and cultural sites on the World Heritage List and later of cultural landscapes, and the introduction of the concept of ‘*Outstanding Universal Value*’ also played a role in advancing this theory. *The European Charter of the Architectural Heritage* (1975) while asking for cooperation and concerted action to ensure the protection of Europe’s architectural heritage is also one of the first Charters to introduce the notion of values, specifically discussing the spiritual, cultural, social and economic values of heritage (articles 3 and 4 of the Charter).

The theory of values based conservation states that there can be many different values associated with a heritage object, which can be sometimes conflicting as different people and groups of people will associate different meanings to it. However, it is important to understand and weigh these values and, as far as possible, to involve all the different stakeholders in the discussion and make the decision on what and how to conserve based on consensus. Also, it is desirable that the “chosen” values or character defining elements be noted in a statement of significance. The 1999 version of the Burra Charter discusses the importance of writing Statements of Significance in which to define the specific characters and values of a place that are to be conserved, while the 2005 Operational Guidelines of the World Heritage Convention also introduce the concept of Statements of Outstanding Universal Value. The Standards for the Conservation of Historic Places in Canada also recognize the importance of defining the Character Defining Elements of heritage and recording them in a Statement of Significance.

As the Parks Canada (2006) document on writing Statements of Significance mentions, “for many years, heritage conservation primarily was focused on the preservation of historic fabric. The values-based approach focuses on the values and meanings that make a historic place significant. Preserving fabric continues to be important, but now in so far as it expresses those values and meanings”.

Types of values

Some of the values traditionally considered are mainly historic, memorial, artistic or archaeological. However, with the broadening of the field of heritage, more types of values need to be considered. According to Mason (2002) the term values can be used in two senses: as morals or principles; and as qualities or characteristics seen in things. He

also illustrates how, throughout time, different authors identified different sets of values. As such according to Mason (2002), Riegl identifies in 1903 the age, historical, commemorative, use and newness values, the Burra Charter (1979) identifies aesthetic, historic, scientific and social (including spiritual, political, national and cultural) values, Lipe discusses economic, aesthetic, associative-symbolic and informational values in 1984, Frey, in 1997, describes the monetary, option (the imaginary satisfaction someone experiences of having the opportunity to use or enjoy a particular piece of heritage), existence (the enjoyment of the mere existence of a heritage good), bequest (the value that future generations derive from a heritage good), prestige and educational values, and English Heritage, in 1997, discusses cultural, educational and academic, economic, resource, recreational and aesthetic values. As it can be observed there is a great deal of overlap between the different values above, and as Mason mentions, in a sense, the different values associated with an object are “different expressions of the same qualities, seen through different eyes”.

Stakeholders

It is important to determine who participates in determining heritage value, whose values are counted and who has power to shape conservation outcomes. Some of the most common stakeholder groups are owners the local, regional national or international community, cultural groups, heritage conservation professionals and other experts, the market, governments, local municipalities, users, non-governmental organizations and future generations. However, the person identifying the stakeholders and them bringing them together is more often than not either a conservation professional, or a representative of local, regional or national governments. This implies that despite efforts

to make values based conservation objective and account for the views of all the relevant parties, this approach can still be biased to a certain extent. Further, as Araoz (2010) recently suggested “values can be neither protected nor preserved. Values simply emerge from and exist in the ether of the communal public consciousness. Any attempt to institutionalize or freeze them permanently would be tantamount to social engineering or even ideological propaganda”.

Potential problems with the values-based approach

Mason (2002) also notes some of the problems of value assessment in conservation planning. He showed that the social, cultural, economic, geographical and administrative context of a heritage conservation project should be considered as much as the object itself and noted that heritage values are varied by their nature and often in conflict with each other. He stressed the need for a multi-disciplinary approach to the assessment of heritage values and the importance in considering the views of both “insiders” and “outsiders” to the conservation process. Mason concluded that an encompassing assessment and integration of heritage values leads to more sustainable conservation planning and management and argues that the most accurate test of the effectiveness of conservation is its responsiveness to the needs of stakeholders, communities, and contemporary society

Ultimately, traditional conservation actively interprets and valorizes heritage and, as Avrami & Mason (2000) argue, any decision to undertake a certain conservation approach prioritizes a particular set of values. The end goal of conservation should not be conservation for its own sake but maintaining a certain set of values, and for this, physical intervention should be considered as only one means to an end.

Values-based conservation and minimal intervention

It is important to identify and consider all the different stakeholders for a heritage place, and see whether their values and interests are in conflict with one another, in which case conserving the values of one stakeholder group may disturb the ones of the other. Power relationships also need to be taken into consideration, when discussing stakeholders and values-based conservation. For example, a local or national government that designates a site as having heritage value may choose to limit access to that site in order to protect it from further deterioration, to regulate changes and alterations or to limit the amount of new constructions that can be built in a historic environment. In terms of intangible heritage, for example, a folklorist or conservation professional upon noticing a ritual mask, a folk costume or a traditional musical instrument may determine that the object represents an important piece of heritage and should be protected. He or she might then take the object from the community who produced and used the object and place it into a museum, where it would be painstakingly conserved in order to be protected and displayed to the general public. However, by removing the object from its original context this can be seen as infringing on the core community's right to enjoy and use its own heritage. It can also cause a loss of meaning as the object was likely best understood while being used in connection to some form of traditional practices.

At the opposite end of the spectrum, there is also the possibility that the values that authorities or developers see in a place are strictly economical or related to land-use, without recognizing the many layers of value that the site may have for other communities. An example of this would be the well spread urban renewal measures that were common throughout most of North America and Europe during the 1960s and

1970s. To use a local example, the enlargement of King Edward Boulevard and re-routing of St. Patrick Street in Lowertown East during the 1960s has led to the destruction of a significant part of the architectural heritage of this important part of the former Bytown – the predecessor of the city of Ottawa. These re-routings were largely connected to traffic needs and the desire for a better connection between Ottawa and Hull, but they were also followed by extensive expropriations, demolitions and subsequent construction of more appropriate housing to address what was considered the sub-standard housing conditions of the area. Unfortunately, these decisions, undertaken with very little consultation with the local population, resulted not only in the loss of a significant part of the built heritage of the area, but also in the gentrification of the area and a certain loss of continuity and the sense of community that had existed in the neighbourhood ever since its first days as a poor, lumber town.

As mentioned before, it is important to determine how to rank stakeholders and decide which values are more important. Even when the stakeholders are not necessarily in conflict, the values of a place themselves may be conflicting. For example, if a very old building which represents one of the last surviving examples of a certain building style, is still being used today it is vital to determine which approach is more appropriate: conserving the building and its material fabric as it stands, or allowing the community to continue to use it, while making the necessary changes necessary to allow its uninterrupted function.

This relationship between minimal intervention and values based conservation is further explored below, mostly in relation to use, social and economic values, as some of the more common heritage values being considered today.

5.4.1 Use value

As noted even by Ruskin in 1848, and as one of the main tenements of sustainability, heritage should be preserved for the future generations and their right to enjoy them not diminished. However, as it was also shown in chapter 4, the current theory of heritage conservation agrees that it is also important to keep the heritage relevant and usable for the present. In considering only future generations and opting for a minimalist, curatorial conservation of our heritage, present communities and the general public may end up wondering why they should care for and contribute to the protection of something which they cannot use, and which is not relevant to the present.

Heritage is generally considered to be a non-renewable resource. However, it remains a resource and should be treated as such and used, not merely conserved as an artifact. Many of the types of today's heritage (from houses, to places of worship to cultural landscapes) would rapidly lose their significance upon losing their function and use for the community. Furthermore, even in what regards strictly the physical fabric of a place, as buildings that are in used are also generally maintained on an ongoing basis, it can be argued that the surest way to destroy it is to keep it from being used.

Therefore, one of the aspects that can be considered when discussing minimal intervention and the use value of places is the practice of adaptive re-use. A prominent Ottawa example is the rehabilitation of the Wallis House at 500 Rideau Street. This former hospital built in 1873 to house the Carleton Protestant General Hospital became a seminary in 1925 and was acquired and used by the Navy from 1943 to 1990 when it was declared surplus. At this time the building was in an advanced state of decay and discussion started about demolishing it. However, in 1994 it was acquired by a group

consisting of Andrex Holdings, Wilberfoss Inc., and Domicile and subsequently converted into loft condominiums. The project, which received an Ottawa Architectural Conservation Award of Excellence from the City of Ottawa in 1998, is considered one of the first most successful adaptive reuse projects in the national capital. In giving a new use to the space, this project also enhanced the social and economic values of the place, while also reducing the environmental impact of building 40 new suburban dwellings to house the families who now inhabit this place. And while some of the original fabric of the building may have been lost in the process, or some of the interior partitioning may have changed, in giving the place a new meaning, use and life, the approach can in fact be considered one that follows the minimal intervention approach when considering minimal intervention in the broader sense of the phrase.

5.4.2 Economic value

The impact of heritage conservation on the economy and the relationship between the two are complex and touching on aspects such as: job creation, entrepreneurship and small business creation, heritage tourism, city centre revitalization, adaptive reuse, globalization, reducing landfill and urban sprawl and improving quality of life.

A Getty report on *Economics and Heritage Conservation* from 1998 discusses that, from an economic point of view, conservation is best modeled as a continuing and contingent process; however, this model contrasts with the conservation field's traditional focus on products and outcomes. Economic factors shape conservation practice by "influencing decisions, shaping policy, encouraging or discouraging the use of heritage, enabling conservation work through financing, giving incentives to stewardship, and so

on". Bluestone (in Getty, 1998) argues that today, the economic aspect is often starting to come before all the other traditional aspects of heritage conservation and that the conservationists' past arguments about stewardship, history and culture are starting to be replaced by discussions on jobs, taxes and tourist revenue, thus potentially leading to a loss of significance and even credibility of the heritage sector. Heritage is starting to be seen as an asset that appreciates over time, requires investment and incurs risk however, Pagiola (in Getty, 1998) cautions that creating an economic model as a way to determine if heritage conservation should be undertaken will not always generate positive answers.

Heritage is also starting to be understood as no longer just an expense but as a sector in its own right, producing jobs and generating revenue; an economic, social and cultural investment (Greffé, 2009). Greffé also discusses the significant number of people working on conservation or rehabilitation projects or using and drawing on heritage assets in their work. He gives the example of cultural tourism where, while the monument acts as the magnet that attracts the visitor to the community, the monument itself is typically only a very minor beneficiary of the economic impact. A 2006 report by HRC + ACO focused on heritage-based development in Ontario, also demonstrates a high rate of return on the investments in heritage properties (with the square foot price sometimes a little lower than new built, and often only marginally higher).

From an economic point of view, resources are limited, and choices are, therefore, inevitable. It is thus important to understand why, for instance, people value a particular object of cultural heritage but also their willingness to contribute to the protection of said site. Furthermore, it is generally understood that cultural heritage does not only generate benefits for people now but also for future generations. However, as future generation do

not yet exist it is difficult to anticipate how they will perceive the preserved heritage. Still, as the Getty report (1998) suggested the decision to invest in conservation may a high degree of uncertainty regarding both present and future benefits, however, the decision not to invest is irreversible, because the object or structure may end up lost forever.

Conservation of the urban historic environment represents a shared responsibility of the decision makers, owners, inhabitants, users, and visitors. When conservation is confined to the realm of monument conservation, and not integrated into the general urban planning framework the overall success of conservation is limited, particularly as sometimes, the heritage field's definition of successful outcomes may be so inflexible that reaching an actual solution may be quite difficult. Furthermore, while architectural values may be well expressed, social values, landscape, and less tangible values that should be preserved are often not clearly defined or lack protection mechanisms (Getty, 2010) or are poorly understood by those involved in the decision - making process.

Alonso & Meurs (2012) discuss the possibilities for the assessment of conservation activities which seeks to determine how successful conservation actions and activities have been, from an ethical and professional point of view, but also in order to demonstrate the effectiveness of conservation in order to justify expenditure or requests for funding, engage with wider audiences and getting more public recognition and support. Some of the means of assessing conservation that the authors mention include: assessing the conservation of the fabric and of nonmaterial cultural values, and assessing the economic, environmental and social impacts of conservation activities. However, although potentially a very useful activity Alonso and Meurs caution that measuring the

performance of conservation activities poses many methodological problems as it involves using radically different indicators, both quantitative and qualitative, which depend on the type of heritage, the type of intervention, and the socio-cultural context in which conservation projects take place.

5.4.3 Social value

As discussed before, the focus of traditional conservation generally consists of selecting (through inventories) and protecting the material authenticity of some of the best examples of monuments from the past in order to pass them down, as the *Venice Charter* preamble asks, “in the full richness of their authenticity” to future generations. However, conserving only a small number of places and maintaining only select buildings of certain classes cannot accurately tell the story of an entire society.

Social value in heritage conservation refers to the special meanings attached to places by groups of people (rather than by individuals). According to *the Burra Charter*, social value “embraces the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a majority or minority group”. According to Johnson (1992) places are considered as having social value if they: (a) provide a spiritual, religious or traditional connection between past and present, (b) help give a disempowered group back its history, (c) represent essential reference points for a community's identity or sense of self and contribute to the creation of cultural identities, (d) play a large part of the day to day life of the community, (e) have shaped some aspects of community behaviour or attitudes, (f) are distinctive landmarks, (g) are accessible to the public, or (h) are places where people gather and act as a community. As

social value may often be based on a continuity of historical attachment to a particular place, it may be difficult in practice to distinguish it from historical value.

Johnson (1992) further discusses that social value can only be evaluated for the present generation, not for future ones, and the best conservationists can do is to ensure that places of such values are retained to enable those future generations to have a choice in how and if to value and protect them. For the conservation of such places of social value the key issue consists of ensuring the continuity of use and access, often with less concern about the intactness of the original fabric as long as the place remains able to evoke the associations and memories. As such, conservation programs must be based in the community concerned and, if possible, allow the community access to and control of 'experts'. The community should be encouraged to take responsibility for their own environment, and discussion on the design of new elements should be done in close collaboration with the community to help define the qualities that make the place, how to protect and reinforce them, and what types of changes are acceptable.

The minimal intervention approach in conserving the social value of historical places cannot follow a top-down approach, with governments and conservation professionals making unilateral decisions on the future of socially significant places. Rather, adopting an inclusive approach by involving the local community in the process helps ensure that the impact to the local community and their values is minimized and in this sense that the heritage objects will be best preserved, most importantly by maintaining their social values. *The Faro Convention* (2005), for example, illustrates this by placing the focus on supporting human development and quality of life, defining

heritage as a resource, something to be used, rather than simply protected, and stating that “individuals rather than objects are central to heritage action” (Council of Europe, 2009).

Generally speaking, a minimal intervention approach to values-based conservation can be best achieved by performing cost-benefit analyses (in addition to accurately identifying the different stakeholders and respective layers of value associated to the place). These can consist, for example, in determining the cost of conservation (and potentially identify and analyze different conservation treatments and assessing them separately) in terms of: economics, impact to the building, loss of original material, loss of value and for which stakeholder group(s), potential social displacements which may be caused, resource use, changes to the general context and setting including increased traffic or parking needs, loss of green space etc. The benefits of carrying on the same project should also be determined using a similar framework: values enhancement and for which stakeholder group(s), resources saved, job-creation, using local workers, resources or traditional techniques, quality of life improvement, increased social cohesion and so on. When discussing very complex sites, which have numerous layers of values associated with them, it is only through undertaking such studies, or similar studies such as heritage impact assessments, while ensuring that they are broad enough to take into consideration all relevant view points, that the true minimal intervention approach to conserving the site can be uncovered. This is not to say that such a process would be either simple or straightforward and in a sense it can only be as good as the framework that supports it. However, when performed properly, it should lead to the best results in ensuring the protection of all the values of complex heritage places.

5.5 Applying values-based principles in conservation work

5.5.1 Sustainable development and heritage-centered development

Bruntland (1987) first defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". It is generally understood as requiring the presence of several '*pillars*' to support it: environmental, economic, and social and while some theorists would add a cultural pillar, distinct from social, and others add an administrative pillar an explicit reference to heritage conservation is often missing (Powter and Ross, 2005).

As discussed in Getty (2010), cities are living environments that constantly change and adapt to the evolving needs and aspirations of their inhabitants. This change should be managed in a way that balances the forces of conservation and development. For this, heritage values of the city need to be clearly identified and their protection and management integrated into the overall planning framework, while taking into account the pressures for modernization, improved living standards, and new environmental requirements.

Today, we seem to be as afraid of saying heritage as we are of saying development. If heritage seems to imply freezing things time and space, no change, no development and no progress, development on the other seems to imply no interest in heritage or the local community, but only on the economic factors. Both of them are generally seen as imposed by outside forces. Heritage-centered development can be seen as a way of incorporating the two, keeping the best of two worlds, while attenuating the negative implications.

Heritage-based development sees heritage as a catalyst for positive change and transformation that can act as a springboard for social development and give historic places a renewed meaning and role in contemporary societies. One of the aims of heritage-based development is also to act as a bridge between the old and new city development paradigms (Council of Europe, 2009).

'Integrated urban development', a notion introduced by the Faro Convention (2005) aims to reintegrate monuments into the life of the community, and give historic resources a role to play in the health of urban ecosystems. This type of development as undertaken for example by the Aga Khan Trust for Culture in Cairo encompasses not only “the physical restoration of architectural monuments, but also the provision of housing, sanitation projects, garbage collection, the provision of primary healthcare and education facilities and micro-financing for small businesses. It also addressed the training of local craftsmen in the traditional arts of carpentry and masonry, skills that were under threat” (Angel, 2012). This type of projects can help marginalized groups to create or increase their own cultural symbols and cultural capital and celebrate their values, history and culture. “Given the opportunity, any group can use heritage and architecture to educate, reverse negative impacts of development, and empower people to direct part of their own future” (Loh, 2010).

Social development, in connection with economic development can help achieve conservation aims while also improving quality of life. As the Getty report argues, conservation is implicitly linked to users and inhabitants as the caretakers of the place and they also help transmit the intangible cultural values of the urban area. Both unrestrained development and conservation of sites that does not take social value and the

local existing context into consideration, can result in gentrification, the displacement of traditional inhabitants, or the abandonment of neighborhoods by the middle-class occupants to lower-income inhabitants, and the loss of the intangible heritage values of the place. Retaining the multi-functionalism of historic urban areas is usually required to preserve its values. Poorly managed tourism-related development, for example, has been known to damage to historically significant urban areas, particularly those on the World Heritage List. Tourism-related development is often seen as the solution to secure the economic viability of historic urban environments, however, in interrupting the balance of the city it often leads to the destruction of the very thing that originally attracted people to the area, thus trading off the permanent loss of heritage value for short-term economic benefits (Getty, 2010).

Without a sound planning framework, urban development and regeneration is often opportunistic and driven largely by economic market forces. This can result in uncontrolled land speculation, mono-functional development, demolition and replacement of heritage buildings or over-gentrification of heritage places and a loss of the intangible values that contribute to the significance of the place. However, in the context of a well defined framework and when consultation with the various stakeholders is properly undertaken development can also play an important, beneficial role (Getty, 2010).

Rather than being a drain on resources, heritage can be a stimulus for social and economic development. Heritage-based development can create models that can be replicated in many other settings and achieves success by bringing together institutional partners, local non-governmental organizations, municipal institutions, neighborhood

representatives, local businessmen and people living and working in the area. Providing a successful example can reverse pessimistic expectations and help people see what is possible. Understanding the local population's socio-economic needs and determining the community's own development priorities should be the first step undertaken as oftentimes, the best development ideas come from the residents themselves. It should also be understood that none of the aspects of development can be treated in isolation from the others. External institutions should help residents identify their own needs and provide some of the means and expertise to create development solutions. The local community can also constitute the main resource for the rehabilitation projects undertaken, by training and hiring most of the necessary staff, trades and skilled workers from local residents, and purchasing local material. This can also lead to the rediscovery or reviving of lost skills that can be used not only as part of the rehabilitation process but also start to be marketed throughout the broader national/international community (Aga Khan Trust for Culture, 2005).

Loulanski (2006) also talks about sustainable development and defines the global localization phenomenon. She gives the example of remote villages in Morocco, Tunisia and Lebanon using the internet as a way to market their traditional crafts and products thus empowering the villagers, maintaining the crafts and local intangible heritage alive. She discusses moving towards a people centered, functional approach to heritage, that is made by the people and defined by them. While traditional heritage conservation is seen as elitist, romantic and reactionary, in conflict rather than in accord with our times she proposes that instead it can be a powerful socio-economic resource, increasing people's quality of life and reinforcing local cultures and social cohesion and contributing to the

economy and tourism and promoting a better use of natural resources. A local example of this type of people-centered development could be constituted by the Byward Market redevelopment plan (Smith, 2010) involved cultural mapping exercises by the residents and users of the space and ended up proposing the protection of the three types of landscape present (commercial, residential, touristic) but not of the buildings themselves, a protection of the values – the activities, not of the actual material fabric. The only attempts of control were in terms of maintaining the activities and the small scale of the area as well as protecting its liveliness and some of its conflicts (pedestrian-car) while trying to keep the area from becoming gentrified.

In this context, both for sustainable development and for heritage-based development, conservation or the use of a minimal intervention approach cannot and should not be imposed from above. Rather, conservation should be open to some amount of change, should understand the needs of the community and work on those specifically, while also protecting the capital letter “H” heritage.

5.5.2 Living heritage

Poulios (2010) states that the values-based approach cannot apply to all types of heritage sites, and that particularly for the so called '*living heritage sites*' a different conservation approach may be needed. A living heritage site is a “site that maintains its original function, as continually reflected in the process of its spatial definition and arrangement, in response to the changing circumstances in society at local, national and international level” (Poulios, 2010).

As discussed above, conservation decisions inevitably favor certain stakeholders and values at the expense of others and that it is seldom possible to protect all the different values equally. As conservation professionals and planners are some of the key players in the decision making and values assessment process, Poullos argues that the values-based approach still often concentrate mostly on the preservation of material fabric and of tangible elements, often assuming that the intangible values are incorporated within and serve the conservation of the tangible ones. In this context changes in the space and function of such places in response to changing circumstances in society at local, national, or international levels are seen as an inseparable element of the continuity and survival of living heritage sites. These sites are inextricably linked to a specific community which has retained its original association with the site throughout time. These communities cannot define themselves detached from the sites and should have the primary role in the conservation and management of the site.

Poullos (2010) further argues that, for living heritage sites, the boundaries between past, present, and future are eliminated and the present is seen as the continuation of the past into the future. In the conservation and management of such sites, the key aspect to be considered should be the present and the present community's association with the heritage site, with conservation professionals or the broader community being given a secondary, auxiliary role. For these places, the physical structure may be given a low priority with emphasis placed on the non physical elements of the sites and objects, their wider cultural significance and conceptual integrity. These sites and objects are often better understood by considering them as processes rather than as products. However, conservation professionals tend to see the core community of a

living heritage site simply as another one of the stakeholder groups, and the core community's association with a site simply as one of many sets of value to be classified and assessed but, unfortunately, this concept of the equity of values and of stakeholder groups is not compatible with living heritage sites. When conservation is being undertaken from above, without consultation with the core community, even if this is done while following all the traditional heritage conservation good-practice principles, the values of the core community can be significantly affected and the very factors that contribute to the site's living heritage value destroyed. If, for example, an indigenous site is being conserved as an artifact and the use and access to the site is restricted for fear of disturbing the original, authentic material, the community might end up abandoning the site altogether and the entire cultural significance of the site (which may derive for example, as Prosper describes in 2007, from specific traditional traditions such as hunting, travelling or gathering) irreplaceably lost. On the other hand, the core community may take an "aggressive intervention" approach for a site of spiritual significance (be it a church, temple, statue, totem pole or any other type of place or object that has cultural and spiritual significance for the core community), by replacing decayed material and not making it distinguishably new, or making changes and additions to a building to suit their current needs; these changes, in a classical heritage conservation view may be seen as detracting from the original construction, however the main use and cultural significance of the place would remain unchanged. While the two examples can be considered extreme scenarios they are not uncommon and it is important to recognize them and adopt a middle way of consensus when attempting to conserve, or protect such places. This would require a certain amount of compromise on both sides, which can be

achieved first through educating the two sides about each other's views and the values that they see in a place. For example, the core community can be advised on ways to maintain the use of a space, design new additions or perform repairs that are also respectful of the original, existing building while conservation professionals or local governments can work together with the community to determine ways in which access and use of sites can be preserved or facilitated to ensure the relationship between the community and the place is kept alive.

5.6 Materials conservation

5.6.1 General considerations

As discussed up to now, in heritage conservation, a lot of focus has been placed on the physical condition of objects and on understanding and arresting material deterioration, particularly in relation to the traditional conservation of isolated monuments where the building is seen as a historical document and all its original material must be protected. However, as it will be shown, minimal intervention may not always be considered the best approach to materials conservation, or rather, the minimum needed may be quite significant. For example, while it is certainly desirable to retain as much of the original fabric and structure of a building, sometimes experience shows that the materials are simply not durable enough in a climate as harsh as the Canadian one, and that minor repairs such as mortar patches, epoxy repairs or pinning a cracked stone often do not perform well on the long run and require increased maintenance and constantly revisiting the work. For this reason, in practice, it is not uncommon to choose a more aggressive approach when, for example, repairing a masonry structure, and opt for replacing a cracked stone or even the complete rebuilding of a destabilized wall. The

typical, sequential repair steps for addressing such deterioration would require minor repairs, retooling of deterioration stone, pinning of cracks and fissures, attempting to stabilize the wall and localized replacement. However, experience (particularly in the harsh Canadian climate) has shown that often minor and moderate repairs are insufficient or do not perform accordingly. This is often a problem of materials compatibility and over-reliance on new, modern materials.

In terms of stone and brick masonry, for example, significant problems are caused by the improper use of Portland cement based mortars to perform repairs while traditional building techniques would have used lime based mortars. In order to perform properly, mortars used in historic structures must ensure that the mortar is weaker and more porous than the masonry unit, allowing the masonry to breathe and acting as the sacrificial material. While lime mortars correspond to this description, while also providing for flexible joints which permit a large range of structural movement, also acting as a wick to draw moisture from masonry and disinfect embedded wood elements, newer formulas based on Portland cement or hydraulic lime have significantly stronger bond strength but also make for an inflexible structure which cannot breathe and properly eliminate the moisture trapped inside (Stuter, Borgal and Blades, 2001). As moisture generally finds one way or another of escaping, it ends up doing so either through the masonry blocks themselves or just adjacent to the mortar joints, and on the long run causing significant damage to the masonry structure while the mortar joints themselves may appear to remain in a fair condition (Stuter, Borgal and Blades, 2001).

However, the economical and even political aspect must also be acknowledged when discussing decision-making and choosing approaches on how to perform materials conservation and even conservation in general. An implicit rule of thumb would appear to be that the higher-profile a site is (generally a public building), and the higher its budget is, the more aggressive intervention performed on it would appear to be. This is not to say that the intervention would be undertaken indiscriminately, and to a certain extent it would still fall well between the limits of a minimal intervention approach, but certainly it often seems to represent more of an interventionist approach than for a smaller-profile publicly owned building, or for a privately owned home. The main two reasons for this can be considered the financial aspect and the problems associated with access to the site. Namely, on the short-run, undertaking a more aggressive conservation, choosing to replace more materials, changing layouts, upgrading systems and structures is much more expensive than performing minimal, localized repairs even if they are done on an ongoing basis and the total cost of such a project depends greatly on the size of the building as well. On the long run however, permanent maintenance and control remain of vital importance in ensuring the continuous survival of the building and, as Kelley and Look (2005) suggest, deferred maintenance can end up costing three to five times more and cause more loss of original material than timely maintenance and repair. The other reason for more aggressive interventions being carried out on high-profile, larger projects relates to accessibility to the site. Performing a significant amount of work on a building is generally most efficiently done if the building is unoccupied; however clients and building occupants generally prefer having to empty the building, or parts of the building, to allow for work to proceed only very seldom. Therefore, both clients and designers

seem to prefer that, when access is given to perform work on an entire building at once, to undertake as much work as possible in order to ensure that the building will not need to be emptied again for the next 50 years and that the repairs and interventions performed will generally have as long a life span as possible. For smaller projects, on the other hand, as emptying the building is more easily achieved, it is seen as less of an issue and the financial factors seem to be the ones to take precedence in most cases.

To use a broad example to illustrate this, in Ottawa, work performed under the Long Term Vision and Plan on federally owned buildings that make up the Parliamentary Precinct is expected to be performed on a much larger scale than for example other smaller historic buildings administered by public organizations such as the National Capital Commission (NCC) or Public Works and Government Services Canada (PWGSC) and often then work undertaken on privately owned buildings such as century homes for example. At the same time, work on these smaller buildings, be they public or private, is often more likely to be undertaken over time, as various smaller projects such as: rehabilitating the interior, installing new finishings, upgrading systems or the structure, rehabilitating the building envelope – either as a whole or in what concerns only the roofing, the windows or the doors, installing fire suppression mechanisms or making the building universally accessible.

At the same time, even for larger projects, certain aspects of the work end up sometimes taking so much time and resources, and being seen as so important in comparison to others that, while significant work may be performed on one aspect, very little work may be done on another. An example of this represents the work performed on the Canadian Museum of Nature where some of the main problems that were to be

addressed related to reinforcing and consolidating the building to address the issues caused with the building sitting on a bed of Leda clay, upgrading the building's envelope and systems to create a controlled interior environment suitable for the use of the building as a museum, and creating a new, contemporary design of the main tower of the building, the upper part of which had been demolished in 1916 due to structural instability. In comparison, aspects such the conservation of the masonry facade or exterior windows rehabilitation were given a somewhat lower priority, most likely also due to budget constraints. While working on a window restoration project on this building over the fall of 2012, the author of the present thesis, while working for an architecture firm in Ottawa, undertook, together with other colleagues, a number of site reviews to inspect the progress and quality of the work being conducted. During these reviews a number of masonry deterioration issues were also observed such as for example: failed pointing mortar and open joints, failed sealing joints, failed and detaching mortar repair patches, but also old cracks opening up and new fissures and displacement. The conditions observed seem to indicate that for one thing, not all masonry repairs that could have been undertaken were performed, and for another, that the building is still moving, either as a result of the Leda clay bed or because it is still settling from the major structural modifications that were undertaken in order to stabilize the building.

Materials conservation is also based, to a certain extent, on past experiences and knowledge gained using a trial and error method. One such example would be the rehabilitation of the Centre Block South Façade completed in the mid 1990s. While significant work was performed on the masonry, in hindsight the approach appears to be one that follows the basic principles of minimal intervention, with limited stone

replacements and repairs to deteriorated stone performed through mortar patches, retooling, or Dutchmen repairs. Visual inspections and surveying of the South Façade in the spring of 2012, approximately 15 years after the project's completion show however that the minimal intervention approach taken did not perform satisfactorily in a number of places. Failure mechanisms were observed especially at the window sills, where a significant number of the Jahn mortar patches or Dutchmen repairs have begun to fail, and at the plinth level. Both failure mechanisms are likely due to a combination of factors, such as water run-off down the facade due to the lack of a proper water management system, coupled with migration of deicing salts absorbed by the masonry in winter through diffusion and their recrystallisation in other nearby areas as salt efflorescences, freeze-thaw cycles and specific patterns of wetting and drying (Barzoi and Ureche-Trifu, 2012). Today, there are several other projects in progress or in various stages of design or execution, on Parliament Hill including the rehabilitation of the Centre Block East and West pavilions which are immediately adjacent to the South Façade. Upon analyzing the performance of the masonry repairs on the South Façade project, the rehabilitation of these pavilions may end up taking a more aggressive intervention approach, with less mortar or epoxy repairs or stone pinning and more stone replacement or partial dismantling and rebuilding being considered. This would ensure a longer life for the rehabilitated facades and a better end quality of the work at the expense of losing some of the original historic material.

5.6.2 The purpose of conducting materials conservation

The end purpose of conducting conservation and especially materials conservation work can have significantly different effects on the decision-making process and end-results expected. Some of the different possible conservation purposes are discussed in more detail below.

- Façade restoration or rehabilitation – often for aesthetic or historic reasons. When the purpose is to create a unified look of the façade this can be achieved, for example, through replacement of deteriorated elements, cleaning the surfaces, reapplying finishing coats, Dutchmen repairs, mortar repairs or epoxy repairs. When the aim is to maintain as much of the original material as possible other means may be employed such as the use of consolidants to stabilize and retain existing moderately deteriorated material, stitching or pinning of fractures, grouting, or performing repairs with precise color matching.

- Addressing interior issues related to the façade not performing (drafts, leaky roofs, structural problems, water infiltration in the basement, mold, efflorescences etc.). In this case there are two options: treating the problem at its root or merely treating the effect temporarily knowing the problem will likely come back. For example, if the problem is a water infiltration one, an option would be to make changes to the design of the building by introducing a run-off water management system where there is none, thus altering the original aspect and design intent of the building but minimizing its rate of deterioration and ensuring a longer life span for it, while the other option would be to simply routinely consolidate and chemically/impregnate the walls against water penetration, and performing cyclical repairs and replacements of the deteriorated

material, thus potentially leading to more significant loss of original material on the long run.

- Façade consolidation/stabilization for health and safety reasons - sometimes it can be merely a ‘band-aid’, temporary solution, to remove immediate safety risks and stabilize the building against potential collapse (with perhaps less consideration being given to the visual impact of such temporary stabilization measures) while waiting for more funds to implement a larger project.

- Changes required by the client, for example to upgrade systems, to improve comfort or air quality, or to gain LEED certification.

- Changes required in order to meet the different codes (for example universal accessibility or fire safety).

- Changes required by a change in the use of the buildings – for example by turning a historic building into a museum and introducing sensitive collection items in the space, this requires providing a controlled interior environment to ensure the conservation of the artifacts.

5.6.3 Materials deterioration, tests and analyses

As many authors agree (e.g. Schuermans et al, 2011; Thomson et al., 1998) testing should be carried out for all substantial conservation projects in order to define all key parameters and ensure the quality of the repair work. The development of analytical capabilities, of non-destructive techniques or of more portable testing facilities, allows for a better understanding of the building, often *in situ* and with minimal impact on the existing fabric, prior to commencing planning and implementing the intervention. The additional costs of testing would be compensated by the savings generated by the

extended life cycle of the buildings. The following provides a more in detail discussion of some of the possible tests and analyses that can be conducted in order to undertake better informed conservation work and ultimately limit interventions (from a material's point of view) to the minimal necessary.

Schueremans et al. (2011) propose a methodology for restoration work based on analytical techniques and discuss the benefits of using analytical techniques to characterize the original material in order to specify the most compatible products to be used in the actual restoration work. The authors also suggest that even when analytical techniques are used in conservation or restoration work, the focus generally lies only on the original material and that the actual performance of the replacement material after application is seldom evaluated. Their research focuses specifically on restoration mortars, but the same principles can, and should, apply in respect to other materials as well, for example, to stone, brick, mortars, concrete, in order to ensure the highest degree of compatibility between materials and therefore the longevity of the work.

Today, various coatings and consolidants have been created to address masonry deterioration. Unfortunately they are often applied without sufficient testing and research beforehand, to determine compatibility with the material, how far they penetrate and how well they bond to the host material. Cnudde et al. (2010) describe the use of X-ray micro-computed tomography (ACT) to determine the impregnation depth of water repellents and consolidants. 3D information about the total porosity and the pore size distribution provides a basic step for extra advice on the suitability of products for the treatment of a particular rock type and determining the penetration depth is crucial for the application of conservation products. Even despite this, it should be noted that the ideal consolidant

does not yet exist, one that is completely, or even partially irreversible, and just as retooling or replacing stone causes a loss of original material, so does the use of consolidants, if in a more subtle way, by changing the inner composition of the materials.

Colantonio (2007) talks about the use of infrared thermography in monitoring the buildings in the Parliamentary Precinct in Ottawa. According to him, this technique can aid in determining the source, amount and location of moisture in the walls, establishing the causal mechanisms of moisture accumulation within masonry wall assemblies, and identifying some of the typical areas where masonry deterioration is likely to occur. This and other non-destructive techniques can then be used to help develop a predictive and preventive maintenance program to reduce preservation costs of these historical structures. IR thermography and radar techniques can also be used to assess the composition of masonry walls, to detect wall voiding (especially in connection with binder migration). Binder migration, discussed by Forster (2007), refers to the deterioration of mortar typically used in traditional mass masonry structures, when certain components within the binder dissolve and move from the body of the material and are redeposited within construction voids, or on the wall faces of the building. This binder migration can constitute a problem for historic buildings over time, especially if the interior masonry has been exposed to rainwater or increased moisture, but also when performing repairs, particularly when using lime based mortars, or grouting, as these mortars need proper time for setting and carbonation, and the structure around, already desaturated, may further contribute to binder migration by fastly absorbing the moisture from the mortar.

Minimal intervention in materials conservation can be potentially achieved by considering all feasible alternatives. Non-destructive techniques should be used as a basis for minimal intervention – if intervention is decided upon, it is important to first understand all the intricacies of the situation and then make an informed decision. As mentioned by Laefer, Evans and Frazier in their article on the settlement of the Collins House in North Carolina (2006), sufficient research and into understanding the problems can save time, resources and provide the best long term results for the building. Sancez-Silva et al. (2011) discuss the importance of including the damage history when studying the life-cycle performance of structures. They argue that it is important to consider everything prior to intervention to ensure that one is making an informed decision and taking into account the accumulation of damage caused by both shocks and progressive deterioration can cause the probability of failure to be significantly higher when these progressive failure mechanisms are considered. They conclude that most existing models overestimate the structural reliability.

Other examples of non-destructive techniques that can be used on historic buildings include: laser 3d scanning (can help for example with determining the displacement of a building façade, and the evolution of the movement if performed periodically; often these displacements are difficult to notice by a visual inspection only and laser scanning can help determine the actual movement and aid in the process of analyzing the future evolution of the building), Ground Penetrating Radar (i.e. a high-frequency electromagnetic method, which relies on obtaining reflections of transmitted electromagnetic energy from objects beneath a surface, or other interfaces between different materials. From the radar sections the thickness of individual construction layers

and the condition of material behind the walls can be estimated as discussed in Lignola, and Manfredi, 2010), or Finite Elements modeling analyses (which can simulate the construction and historical phases of the building).

Using a combination of different testing methods can be most successful because the drawbacks of each technique are supplied by complementary data provided by other techniques. As some high profile buildings do not allow repeating routine interventions, the need to ensure the best possible results while nevertheless respecting the building's appearance and the structural integrity and being as little invasive as possible is becoming even more urgent.

5.7 Adaptive re-use, urban planning and code compliance

Current issues such as code compliance, fire protection, or universal accessibility, require a lot of creativity when dealing with historic buildings, in both the designer and the regulatory bodies.

The application of modern building codes and standards, and current safety levels to heritage buildings can be extremely difficult and may require excessive, if not impossible, measures that sometimes ignore the robustness of these historic buildings and are also incompatible with conservation goals (Kelley and Look, 2005). This can lead to major and often unnecessary interventions on fabric of historic buildings. Seismic reinforcement, for example, may require building a new structure (internal or external) to ensure proper support of the building, dismantling and rebuilding, shoring, stitching or bracing the structure or, in extreme cases, abandonment and/or demolition of a place that is no longer seen as structurally sound. Instead, special consideration should be given to

performance based rather than rule based codes of practice (such as the new Ontario Building Code proposes), creative management and flexible solutions.

In terms of fire protection, installing a fire suppression system in a historic building can involve considerable work and a physical and visual impact on the building. However, if the building is considered highly combustible and could burn down, it is advisable to install some sort of fire suppression and monitoring system, which would ensure that a fire cannot spread too easily in a building. Still, potential alternative solutions should always be considered prior to making irreversible changes to the fabric of the building, and these could include revising the management practices, installing movable installations, replacing or repairing old, poor-quality systems, installing wireless devices, or using new technologies for fire-suppression such as water-mist and the hybrid water-mist nitrogen system, which result in much less water damage to the interior of a building if activated.

It is also noteworthy to mention here the *Accessibility for Ontarians with Disabilities Act* which aims to achieve accessibility for Ontarians with disabilities with respect to goods, services, facilities, accommodation, employment, buildings, structures and premises by January 1, 2025 at the latest. While this Act does not, at this time, require existing buildings to be retrofitted to meet accessibility requirements, the Accessible Built Environment Standard (now in draft form) will require that buildings that undergo extensive renovations to conform to accessibility requirements. At the same time, numerous public buildings, especially in the nation's capital, Ottawa, are already considering accessibility improvements as a significant part of rehabilitation projects. However, when attempting to make these public places universally accessible, trying to

reconcile this with a historic interior can also pose significant challenges. The end result is often a compromise between the two equally important sets of values. An example of making the building accessible can be something as simple as installing a stair lift but it may also require significant changes to the interior of the building, for example by altering door frame widths or having to remove historic doors and hardware, introducing ramps or having to close down main, historic entrances that cannot be made accessible. For reasons of equity and human dignity, if the main entrance cannot be effectively adapted, it may be recommended to close that entrance and provide equal access, to all members of the public through a single, if previously secondary, entrance. And while the rights of all people to equally enjoy a place must come first, the effect of such interventions on historical buildings should not be underestimated and the full creativity of the design team used in exploring potential alternatives. To a certain extent, making the building accessible can be considered a new phase in the natural evolution of the building, but caution should be exercised in designing these new changes, so that they are respectful of both the users and, as far as possible, of the original building, and ideally contemporary, artistic creations in their own kind.

Another way of achieving accessibility standards can be installing a lift that stops at all the intermediate levels of a historic building without altering the internal layout of these levels, as was done for example at the Stable Building at Rideau Hall in Ottawa, owned by the NCC and which was renovated in the early 2000s to accommodate offices and technical spaces for the Rideau Hall complex. The project also received a City of Ottawa Award of Excellence for Adaptive Re-use in 2005. Finally, another successful example of addressing accessibility concerns can be seen in the adaptive re-use of

Gasometer Building, part of the same Rideau Hall complex. Here, the circulation problem was addressed by electing to construct a new subordinated addition to the building to house all vertical circulations. Relocating the circulations to the addition also served to give back to the Gasometer Building a part of its original character, namely the roundness of the building, while the new addition represents a valuable architectural work in its own kind, while remaining clearly recognizable, subordinate and complimentary to the original building.

Special attention should also be given to the aspect of removing hazardous materials (e.g. lead containing paint, asbestos, silica dust resulting from stone cutting) which remains a problem when undertaking conservation work on historic buildings nowadays. And while it is certainly necessary to remove these materials to ensure the health of building occupants, often, when not done properly, this removal of hazardous materials can lead to a significant loss and destruction of original material, especially in what regards the interior finishes of the place. Further, as contractors working on these projects often have limited knowledge or respect for heritage and original historic material, when the client or the designer is not properly involved in the process, the contractors may choose to use the cheapest or fastest, but often also most destructive means to remove these materials, thus increasing the loss of original material.

5.8 Evolution of heritage conservation theory over the past century and a half and its reflection into practice

As the previous chapters have shown, the evolution of the theory of conservation and of the minimal intervention principle, as well as its application into practice has been hardly as straightforward and uncomplicated. The following represents a short illustration of how the principle of minimal intervention might have been applied in practice over the past century and a half using three specific case studies. The examples are based on real conservation projects that have been completed in the near past and seek to illustrate the application of the minimal intervention principle on three different aspects of built heritage conservation practice: materials conservation, adaptive re-use and intangible matters.

Materials conservation

The first case study considers minimal intervention in relation with the field of materials conservation by taking the example of a masonry wall. Considering the wall as constituting the perimeter fence of a highly significant heritage site, this fence would be designated as part of the entire site and be considered as having a significant heritage value on its own. However, as this is an exterior unprotected masonry wall at least one hundred years old, it is to be assumed that the fence would have been exposed to quite severe conditions over its life span and pose problems such as difficult footing conditions, severely deteriorated masonry, displacement, open joints, cracked or missing stones, unknown or variable wall composition due to past repairs. Considering the length of such a wall and the significance of its relationship with the rest of the site it is to be expected that its rehabilitation would be undertaken in phases. Lessons learned from the

first phases could then be used to inform the rehabilitation of subsequent wall sections, by, for example, providing additional information on the footing conditions, stability of existing foundations or lack thereof, specific wall composition, types of stone and mortar used or ease of removing deteriorated stones. This could lead to revisiting and reconsidering proposed conservation treatments based on this additional information and, for example, if the original treatment called for was a very strict conservation, with limited repair and stone replacement, the end result may be that the current condition of the wall actually warrants full reconstruction, fully addressing issues such as poor foundations, water infiltration or frost damage. And while this may seem as a more aggressive intervention and one that hardly corresponds to the principle of minimal intervention, when taking into account the economic value for example (namely that if the reconstruction is properly undertaken there should be no need for anything but minimal regular maintenance of the wall for the next half a century) or that for the general public the intervention, once complete, would remain mostly invisible and might even be seen as enhancing the wall's values, this approach can actually be seen as a very successful one.

Were this project to have taken place in the late 19th century or early 20th century the outcomes would have likely been quite different. If, for example, one is to consider the anti-interventionist doctrine of Ruskin and Morris, it is to assume that the wall would have been left in its state of deterioration to eventually become a ruin, with little to no intervention in conserving it. The beginning of the 20th century, with its love of new materials as seen also in the Athens Charter would have likely seen the wall repaired using Portland cement or metallic inserts. While this might have stopped the deterioration

for a while, and was sure to have been considered a minimal intervention at the time, as time has shown the impacts of such repairs on a traditional masonry wall, particularly one in such exposed conditions would have likely led to a much faster deterioration of the masonry over the following decades. A rehabilitation project today, as discussed above, may end up proposing a full wall reconstruction but it would do so reusing as much of the original material as possible, and using similar, compatible materials and technologies for the reconstruction. Table 1 below briefly illustrates these changes in conservation philosophy.

Table 1 – Evolution of minimal intervention in relation to materials conservation

Adaptive re-use

The second case study considers the evolution of minimal intervention in relation with design and adaptive by taking the example of a recent rehabilitation project in Ottawa, On. The Gasometer Building owned by the NCC is situated in close proximity to the residence of the Governor of Canada at Rideau Hall. The building functioned as a gasometer between 1877-1915 when its function became obsolete; it was then turned into

a laundry facility with the addition of a new intermediate floor and served this function from 1917 to 1976; since that time it has housed different offices, with a new retrofit of the building taking place in the early 1990s. The late 2000s saw the building as not universally accessible; with its structure, finishes and systems in need of repair, rehabilitation and upgrading; and an inefficient use of floor space.

Figure 7 - Gasometer Building, Ottawa. (a) new addition; (b) detail showing the connection between existing building and the addition.

The rehabilitation project designed by Robertson Martin Architects rehabilitated and conserved significant original materials, replaced and upgraded systems, cleared and opened up the interior space. In order to make the building universally accessible and create a better use of space, all vertical circulations were moved to a new, contemporary purpose-built addition (Figure 7). This has also helped bring back the original roundness of the building, making the original space more readable, but also making the space usable, keeping and enhancing the different floors that have been added to the inside of the building over time.

Figure 8 - Gasometer Building, Ottawa. Bringing back the roundness of the space. (a) & (b) interior views at the upper level. (c) interior view of the HVAC at the intermediate level.

Again, had this project taken place in the late 19th century or early 20th century the approaches, and outcomes, would have likely been very different. If, for example, one is to consider the Unity of Style doctrine it might be assumed that the intention would have been to recreate the original Gasometer building, to remove all new additions and changes to the building, including the intermediate newer floors. While would have undoubtedly also helped bring back the roundness of the space (Figure 8), removing all interior floors would have made the building hardly suitable for use as office spaces. The approach in the mid 20th century on the other hand, might have placed too much focus on

authenticity and maintaining all the layers of the building, including the interior clutter that had contributed to making the building almost unusable and would likely have been opposed to the idea of removing an existing element such as the vertical circulations and interior partitioning, or creating a completely new addition only for circulation purposes. Table 2 below briefly illustrates these changes in conservation philosophy.

Table 2– Evolution of minimal intervention in relation to design and adaptive re-use

Intangible matters

The third and last example considers the case of minimal intervention in relation to intangible matters. The Canadian Museum of Nature in Ottawa, On., represents the oldest Canadian purpose-built museum and is still functioning as a museum today. However, the building that houses the museum has had numerous problems over time. Built on a bed of Leda clay the structure had been unstable from the beginning and the upper part of main tower had to be taken down because of structural movement in 1916. Showing significant structural damage and movement the building was no longer able to properly function as a museum and a rehabilitation project was commenced in the 2000s. During this project a

new independent interior steel structure was created to help address the structural issues; new lantern tower was created that both helped solve vertical circulation issues and made a visual reference to the former masonry tower; changes to the interior layout took place and a controlled interior environment was created to better accommodate the collections housed by the museum (Figure 9).

Figure 9 - Canadian Museum of Nature, Ottawa. The building after the renovations (2013).

These changes not only helped rehabilitate the building but also ensured that its function as a museum, one of its most important identified character defining elements was preserved (Figure 10). What is more, although the museum had always been a significant part of the local community, since the renovation the museum seems to have been almost reborn and a much stronger local and regional appreciation of both the institution and the building is easily visible. The rehabilitation project has contributed not only to the survival of the building but has also helped enhance the site's intangible values, the social and cultural values associated with its museum function and also the landmark status for the local community.

Figure 10 - Canadian Museum of Nature, Ottawa. Detail showing the new lantern tower and banners announcing the new exhibits (2013).

Nevertheless, had the project taken place in a different time period it is to be expected that the results would have been quite different. For the 19th century, be it Unity of Style or the anti-interventionist doctrine, they both would have focused specifically on material fabric. Either focusing on rebuilding the former tower or “a tower” that was deemed to be appropriate for the overall style in the case of the former, or letting the building die an honorable death in the case of the latter, little importance would have likely been given to the function of the building. The same holds true for the first half of the 20th century. While Riegl is one of the first to start discussing values, it is to be assumed that neither in his case nor, for example, if applying the Venice Charter, would the use value – the museum function of the building – have taken priority over material fabric or issues such as authenticity. It is to be expected that sooner or later the museum function would have been lost, or at least significantly degraded, either by attempting to ‘make do’ with the building in its current state, with minimal repairs and maintenance as

needed but no significant changes until it no longer became possible for the building to accommodate the museum function, or by actually discarding this use as not compatible with the building and attempting to give the building a new use, more suited for the existing fabric. Neither of these approaches would have placed much value on the intangible aspects associated with the site and it was not until the broader, more recent discussion on values-based conservation that the preservation of the intangible assets of the building was made possible. Table 3 below illustrates the transition.

Table 3 – Evolution of minimal intervention in relation to intangible matters

6. Conclusions

6.1 Minimal intervention in conservation theory and practice

Origins of the minimal intervention principle

As it was shown in chapter 3, the principle of minimal intervention is traditionally connected to the idea of authenticity, original historic fabric and conserving the monument as a historic document. While to a certain extent the principle is based on the age-old tradition of maintaining and repairing buildings in use, the minimal intervention approach to heritage conservation was developed in large part due to the specific historic, cultural and social context of the mid to late 19th century in Europe. More specifically, the main factors that led to the birth of the minimal intervention principle are: (i) the industrial revolution and the threats it posed in terms of destroying the traditional ways of life up to that point, (ii) the romantic, almost fatalistic, view that characterized the end of the 19th century with its passion for patina, the picturesque and ruins, and (iii) last but not least the stylistic restorations that had been carried out through most of the 19th century in countries such as France or England which were seen as falsifying true history.

This represents the philosophical basis for the development of the minimal intervention principle. However, it was not until almost a century later, when, due to significant scientific advances, discussion about minimal intervention and putting it into practice started to become more common.

Minimal intervention in national and international legislation

While first mentions of the principle of minimal only take place in the 1980s, a review of key international and national Charters and best practice guides revealed that:

- i. While most documents reviewed make implicit references to the minimal intervention principle, only very few of them actually refer to it by name, and furthermore, no clear definitions are given or the definitions only apply to a very narrow field;
- ii. The minimal intervention principle seems to be most often referred to in relation to adaptive re-use and the changes required to maintaining buildings functional, or changing their use;
- iii. Integrity, authenticity and preserving all layers of history are also important aspects in which a minimal intervention approach is recommended;
- iv. Conserving and investigation archaeological remains should be undertaken using a minimal intervention approach;
- v. A significant part of the documents reviewed advocate for a minimal intervention approach in issues relating to urban planning, design, and applying contemporary building codes to historic buildings.

Curatorial conservation versus values-based conservation

This minimalist approach to intervention in heritage conservation, based on the 19th century Europe view on heritage, which sees the building mainly as a historic document is more suitable for dead heritage sites than to living ones. Certainly, it can be argued that in a values-based conservation framework there may not be any such thing as a dead heritage site. However, this debate is outside of the scope of this research. Consequently, for the purpose of this paper it will only be argued that some sites are more 'alive' than others and that often, for these more alive sites, the principle of minimal intervention as it has been traditionally understood does not function

satisfactorily. As current research in the field shows (which is focused almost exclusively on collections conservation), and as even recent legislation and best practice guides demonstrate (which stresses the importance of a minimal impact to archaeological remains), this approach is more suitable for collections, artifacts, ruins or archaeological remains than for preserving heritage places which are still in use.

When applying a values-based approach or discussing living heritage sites it is much more difficult to assess what a minimal intervention approach means. It is important to have a broad understanding of the site being considered, with its various values and groups of stakeholders and their relative ranking, to understand if the values or stakeholders' interests are conflicting, if there exists a core community and so on.

Ultimately, a minimal intervention approach can be applied in protecting one of the site's values, or one of the stakeholder's interests, with dramatic effects on the other remaining values. In this context it is, perhaps, more important to consider minimizing the overall impact of any intervention, or conservation activity, on the site as a whole, with its network of values, then of applying a minimal intervention approach in conserving any one value. This will help ensure the long-term survival of the site, and more importantly of its meaning and significance.

Minimal intervention and materials conservation

When discussing minimal intervention in terms of materials conservation, the effects of the climate on buildings should also be taken into consideration, as experience shows that sometimes it ends up being more feasible to perform more aggressive intervention from the beginning – as an approach that is proven to address the problems, than to perform only minimal repairs. As well, even in less harsh environments,

performing only minimal, emergency repairs to a building (usually combined with little maintenance in between repairs) often leads to the need for more significant and more costly repairs on the long-run. The amount of intervention performed when conducting materials conservation is also related in part to lessons learned from previous projects that have demonstrated the constraints and inefficacy of using a very strict approach of performing only minimal repairs, which often leads to an increased necessity of frequently revisiting the project and conducting new intervention. These repeated “minimal” interventions in the end are proving to be much more intrusive than what would qualify for a somewhat more “intrusive” intervention in the first place.

As mentioned above, the original objective of minimal intervention was to preserve the authentic fabric of historic buildings. Today, a minimal intervention approach in terms of materials conservation can be achieved, to a point, through a sound decision-making process. This can include performing a thorough analysis of the building, using, as far as possible, non-destructive techniques to complement historical background research and to supplement, as much as possible, the need to perform investigatory openings which may affect the historic fabric. It should also include care in selecting the proper materials for repairs, replacements or additions that are compatible with the original material. This compatibility should be thoroughly tested before applying the material *in situ*, through making use of all the scientific means that the conservator can have access to. This may include historical and technical research, but also performing analyses (physical, chemical, petrographical, bio-chemical) on material samples to determine the characteristics of the original material but also to determine the compatibility and performance of various proposed recipes.

Sometimes, intervening too little on a building can cause more harm on the long run. On the other hand, intervening too much, or without careful consideration to the various layers of values involved, can lead to a loss of value. This can include loss of community value, of historic fabric, or loss of meaning. Too much intervention, for example, by applying the more and more common technique of façadism (i.e. demolishing and changing the interior of a historic building, often to the point of building an entire new building while maintaining the exterior façade of the building, or part thereof, seemingly unchanged), can leave the building merely as an empty shell, unrecognizable as either historic document or heritage building. The required minimum when intervening in a historic building should therefore vary on a case by case basis.

Minimal intervention and building legislation

Current legislation, technical and social concerns often makes applying a minimal intervention approach to heritage conservation more difficult than it would appear on first glance. Again, here the question must be asked what is it that we are trying to conserve, and on what do we want to have the least impact: on the building or on the people using and inhabiting it? For example, concerns relating to fire protection, seismic reinforcement or universal accessibility require a high degree of creativity and adaptability from the designer in order to address them while minimizing, as much as possible, the impact to the original fabric and layout of the building. However, the end goal of these exercises should be understood not as conservation or rehabilitation for its own sake, or for the buildings sake, but rather to ensure the continuous use of the place, to minimize changes to its cultural significance by minimizing risks to occupants and users and maximizing access to the building's resources. From this point of view, more consideration should be

given to the fact that often, the material fabric is not and should not be considered as the single most important aspect of the heritage place. More emphasis should therefore be placed on its other complementary values, even if this may sometimes be done at the expense of some of the original fabric, though not necessarily. Proper care in ensuring maximum retention of the physical character defining elements of a place should always be taken, but as mentioned above these physical aspects should not be considered as taking precedence over the intangible aspects.

Minimal intervention and sustainability

As numerous authors agree (e.g. Ross, 2006; Stovel, 2011) built heritage conservation and re-using the building stock is an inherently sustainable practice. It helps in reducing urban sprawl and the pollution and fuel-consumption associated with it, reducing landfill and conserving the embodied energy of these buildings. It also contributes to an improved quality of life, with walkable neighborhoods and a more human scale to cities. In this context, it is also important to consider minimal intervention in terms of the conservation of building settings or historic urban districts. More specifically, it is becoming more and more urgent to seriously consider the benefits of allowing more sensitive, compatible development, re-development, adaptive re-use and intensification of sites, particularly those situated in urban centres, in order to minimize the overall negative socio- economical and environmental effects of urban sprawl, gentrification or ghettoization and abandonment of older downtown areas. This would require taking a step back and shifting the focus from conservation of only buildings or places to conserving our heritage in the broadest sense of the word – our society and our planet.

The factors and effects of minimal intervention

Minimal intervention is a relative concept. Just as the Nara Document states that authenticity needs to take into consideration the site's broader cultural context, the same is true when discussing minimal intervention. When discussing conducting heritage conservation using a minimal intervention approach, first the type of heritage that is being conserved needs to be clarified; second, the specific aspect of the place that is being discussed should be addressed and thirdly the sites' wider context should also be considered. For example, minimal intervention does not mean the same thing for a ruin, church or landscape, just as it does not mean the same thing when, for a church for example, discussing materials' conservation, adaptive reuse or additions.

Some of the factors that influence minimal intervention, as discussed in the above chapters include: economic and environmental values in connection or in opposition with historic, age or artistic values, and generally speaking the identified character defining elements of the place, structural and materials performance issues, health and safety concerns, social and community aspects, tourism, quality of life, urban planning and urban sprawl, climate conditions and climate change as well as the specific legal framework and decision-making process.

6.2 The irreversibility of any level of intervention

As discussed also in some of the previous chapters, current literature tends to agree that there is no such thing as a reversible action in the field of heritage conservation. Every action and decision, even the decision not to intervene on a site can be considered an intervention, and what is more, an irreversible intervention.

As Kelley and Look (2005) observe, when it comes to heritage objects, others have likely intervened before us, and their work has an impact on our decisions today. Similarly, our own interventions will have an impact on the decisions of tomorrow and may be evident for years to come. In general, any intervention, no matter how large or small, damages the historic fabric of a building in some way. The use of new materials, which may not be compatible with the original ones, can endanger the historic fabric and lead to a loss of authentic fabric or of components of the building. Changing the load path of a structure, or adding significant new loads, can also have serious and unwanted side effects. Even the decision not to intervene in a heritage place is irreversible and will in time lead to the gradual deterioration and loss of original material and eventually of the entire site.

Cultural landscapes and living heritage sites also constitute examples of the fact that heritage itself is never a finished product, but rather a dynamic and fluid cultural constructs that is always in the process of being shaped and reshaped. In this sense, any past intervention and any intervention of today (even non-intervention) is irreversible and will have an effect on how current and future generations see and experience the site.

6.3 Types of minimal intervention

During the present research a number of different interpretations and uses for the principle of minimal intervention emerged. They are described briefly below:

a) The curatorial approach: similar to the approach taken to conserving collections or artifacts. The approach is closely connected with preservation of fabric, authenticity and viewing the heritage object first and foremost as a historic document that must be preserved in all its integrity and entirety in order to properly preserve and transmit that historic value to future generations. This approach is perhaps most connected with the Euro-centric view of heritage and particularly with the conservation of ‘less alive’ heritage objects for which the historical value is seen as the most significant.

b) The surgical approach: which sees the processes associated with conservation as harmful to the heritage object and seeks to minimize their impact. This can refer both to very specific conservation process such as preservation of material fabric but also, especially, to what are seen as more destructive processes such as adaptive re-use or rehabilitation. This can be clearly seen in the numerous Charters discussed in chapter 4 that advocate for a cautious approach during adaptive re-use projects and that often tend to place the historic fabric of a site above its social or use values.

c) The sustainable approach: this is the approach that is slowly starting to become visible in the practice of conservation even though it does not seem to be significantly represented in conservation theory to date. The approach proposes that conservation of the built environment, particularly in urban locations where large parts of built heritage resources are located, is inherently sustainable at the philosophical level as it uses existing resources and should be preferred, whenever possible, to new constructions as it

helps develop the local communities and increase quality of life and the livability of such communities, uses less new resources and energy and creates less landfill, while also contributing to a reduction of urban sprawl.

d) Considering the object as a whole and its broader context: This is the approach that this thesis proposes as the future of minimal intervention which consists of analyzing the broader context of the heritage object before deciding what would truly constitute a minimal intervention. It asks to determine the proper level of intervention for each place so as to have both the least detrimental and the most beneficial effect on its values as a whole. This considers the broader meaning of the minimal intervention principle – one that is applied to heritage conservation in general, not only to the conservation of buildings or character defining elements. The question that needs to be asked for this approach to be successful is what it is that we are trying to conserve, or have the least negative impact on: the building in itself, its material fabric, its values, its users, the local and regional community or the planet. A successful approach to minimal intervention should take into account the impact of the conservation practice and decision-making in general on all the values associated with the object and on all the stakeholders involved, by considering the broader issues associated with conserving or not conserving a place and different ways in which conservation can be practiced, such as community, quality of life, sustainability and the environment.

6.4 Future directions of research

The present research has sought to contribute a broader definition of the principle of minimal intervention, in the context of an ever-expanding field of heritage. However, as the heritage field is becoming ever broader and more complex and as more and more of the traditional conservation principles are starting to be questioned, this poses significant challenges for both the theory and the practice of conservation. As questions inevitably arise about the relevancy, in today's context, of the Venice Charter or of principles such as reversibility, authenticity or minimal intervention there has been some discussion lately (see for example Araoz or Petzet) about the need for a new heritage taxonomy. It is certainly difficult to argue against the significance of the Charters of the mid 20th century or against the 'good intentions' and common sense behind the traditional conservation principles. Still their usability in and of themselves seems to become slowly limited. Perhaps a new heritage conservation taxonomy is in fact in order as this would help better differentiate between the different types of heritage and it would aid in applying existing (and future) charters and principles to these better differentiated branches of heritage. As one of the most significant difficulties in today's conservation field is applying the same principles to different aspects of heritage, a better classification of heritage types, heritage attributes and conservation principles as they apply to distinct kinds of heritage would likely prove highly useful.

At the same time, for the purpose of advancing the current state of knowledge on the principle of minimal intervention, and gaining a better understanding of the potential future applicability of the principle, particularly in its traditional understanding, a comparison between how the principle of minimal intervention is currently applied in

European versus non-European countries would prove highly valuable. As the current research shows, the traditional understanding of the principle of minimal understanding, still very much in use today, is very much connected to the 19th century European view on heritage. It would be both interesting and useful to see whether that view is still prevalent in Europe today, to what extent it has been exported to other continents and how other, non-European ways of thinking are influencing the practice and theory of conservation, and in particular the idea of using a minimal intervention approach to conservation and what this approach is expected to consist of. While places such as Japan or Australia have already lead to advancing the field in terms of issues such as authenticity (see the Nara Charter) or values-based conservation (the Burra Charter), as was it discussed in this research, discussion on the principle of minimal intervention is only just beginning and the principle has yet to be discussed in detail outside of the field of collections conservation and at a broader, global level.

6.5 Concluding remarks

As the practice of conservation seems to become more pragmatic, at least to a certain extent, its theory has been somewhat slow to change and adapt. We are still used to considering that any intervention that, for example, does not follow the principle of minimal intervention or reversibility is not worthy of being called conservation. This research proposes that, in a similar way to authenticity which has been accepted as having different, valid, interpretations depending on the socio-cultural context, so should other heritage conservation principles, such as minimal intervention, benefit from certain flexibility in their interpretation, depending on each project's specific circumstances. In

practice, depending on what particular aspect of conservation that minimal intervention refers to, especially when using the values-based conservation approach, the limits of what minimum refers to are constantly being pushed forward, depending on the highest ranking values associated with the place.

While not undermining the historic value of original surviving material or the physical character defining elements of a heritage object, a true minimal intervention approach to conserving the built heritage today should place more focus on the intangible and associated values of these places, particularly on social and environmental aspects such as maintaining the human scale of our urban centers, increasing the quality of life, empowering communities or reducing urban sprawl.

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