

HUMAN RESOURCES IN CANADA'S BUILT HERITAGE SECTOR

Mapping the Work Force
and Setting Strategic Priorities



Cultural
Human Resources
Council

Conseil
des ressources humaines
du secteur culturel

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1. Executive Summary

Context

- This study was commissioned by the Cultural Human Resources Council, supported by Human Resources and Skills Development Canada and Parks Canada. The study builds on previous work undertaken by the Heritage Canada Foundation (HCF).

Human Resources

- Human resources in the built heritage sector encompass a broad range of occupations. The built heritage sector is a continuum that begins with the formulation of policy, proceeds to the design and execution of intervention strategies, and ends with ongoing maintenance of heritage structures and related cultural and interpretive programming.
- *A key conclusion of this report is that the built heritage sector is distinct from both new construction and ordinary renovation and repair. Employment in the built heritage sector requires fresh attitudes, specialized training and experience, and distinct skills. This applies equally to professional and technical occupations and to skilled tradespersons.*

Trends

- Over the past twenty years, but especially in the past ten years, changes in the built heritage sector have had a cumulative impact on human resource requirements. More favourable public attitudes, increases in capital funding, and changes in the policy environment have all had a positive effect on the sector. A key development has been the federal government's Historic Places Initiative.
- There are also negative trends. Demolition continues. Governments are divesting their real estate assets. In the private sector, financing and insurance problems continue to pose problems for preservation-based redevelopment of heritage structures. However, *most stakeholders agree that the amount of work in the built heritage sector has increased.*
- In the past, human resources have not occupied a central place in heritage policy discussions. This is no longer appropriate. *The future success of heritage policies will depend on the availability of an appropriately skilled work force.* Ensuring this availability of skilled workers will require focused human resource planning.

Human Resource Strategies in the United States, the UK and Ireland, and Australia

- In the United States, heritage work is undertaken with support of public grants, and in the private sector, with the support of federal tax credits. Private sector work using tax credits exceeds the value of work directly financed by the federal government. State and local governments are also involved in the built heritage sector through grant and loan programmes and property tax easements. A key role is played by the National Parks Service (NPS) which administers both grants and the federal tax credit system. The NPS requires bodies which receive federal funds, including federal tax credits, to adhere to specified *Occupational Standards* that focus on the distinct skills required in the built heritage sector. The *Occupational Standards* apply to 12 professions, including architects, engineers and conservators.
- In the UK the “national trusts” played a key role in bringing stakeholders in the built heritage sector together to develop occupational standards. Standards and certifications have been developed for technical occupations and are in the process of being developed for architects. In Ireland, the architectural profession has adopted specialist designations for the built heritage sector. Occupational standards are also being developed for skilled trades under the auspices of a the National Heritage Trades Group which is a stakeholder body established by the sector council responsible for training in the construction industry.
- In Australia, heritage protection is integrated with environmental protection. There are no specialized accreditations for architects or engineers who work in the built heritage sector. The system of voluntary accreditation for conservators has only limited application. The absence of specialized certifications does not appear to be a major issue for Australian heritage bodies. The largest Australian state, New South Wales, launched a concerted program to address shortages of heritage trade skills. This strategy is integrated with the existing apprenticeship system and national competency standards.

Professional Occupations in the Built Heritage Sector

- *The sector requires an overall human resource plan for professionals working in the built heritage sector.* This plan should address professional recognition, professional development, and succession planning. As well, the sector need a more developed dialogue with professionals in urban and community planning.
- *Professional development for the incumbent work force is at least as important, if not more important, than training new entrants.* The sector needs a general review of its professional development requirements and the institutional and financial resources that are available to meet those requirements.
- The network of discipline-based and multi-disciplinary organizations plays an important function in strengthening professionalism the built heritage sector. Supporting this network is imperative. *A significant gap in the sector's organizational fabric is an organizational “home” for professionals who are employed in the public sector and by heritage institutions in the non-profit sector.* These professionals, whom we estimate to number approximately 2,500 to 3,000 persons, have a number of common interests that currently do not find sufficient organizational expression.

Architecture and Engineering in the Built Heritage Sector

- *Architects and engineers working in the built heritage sector require distinct skills that take account of preservation goals. Architects, in particular, play a key role in the sector owing to the project management role which they frequently undertake.* The report proposes a research project focused on the role of architecture and engineering in the built heritage sector. This research project should be developed in co-operation with the architectural and engineering professional associations and with major public and private owners of heritage structures. The purpose of this research project would be to document the extent to which professional specialization already prevails in the market and to identify how the need for specialized skills should be addressed.

Skilled Trades and Contractors in the Built Heritage Sector

- There are no reliable estimates of the number of skilled tradespersons or contractors who regularly work in the built heritage sector. Interviews and focus groups identified *widespread concerns about the lack of heritage skills among both skilled trades and trade contractors.* This problem is especially acute when inexperienced contractors win jobs in the built heritage sector. Any training strategy for skilled trades in the built heritage sector must rest on a solid analytical foundation. This includes a demand analysis, a supply analysis, and an analysis of the of specific heritage skills required for each trade.
- *A more fundamental challenge is to structure and deepen the dialogue between the construction industry and professionals within the built heritage sector.* This distance must be bridged before specific initiatives are undertaken. The report recommends that Cultural Human Resources Council ask the Construction Sector Council to establish a Heritage Trades Group. In addition to construction industry representatives, the proposed Heritage Trades Group should include key stakeholders in the built heritage sector. The Heritage Trades Group should be asked to undertake a systematic analysis of human resource needs involving skilled trades in the Built Heritage Sector and to recommend specific steps appropriate to each trade.

Data Gaps

- Better human resource planning in the built heritage sector requires better estimates of the number of persons who work in the sector, their occupational distribution and their demographic characteristics. Equally, it is important to have better estimates on the amount of construction and repair spending in the sector and the distribution of the related work across the trades. The absence of key employment and economic data was a one of the themes of the Heritage Canada Foundation's report, *Human Resource Issues in the Preservation of Heritage Buildings*. The report recommends that the Built Heritage Committee prioritize the sector's data needs and consider strategies for rectifying the most serious deficiencies. These strategies could include customized surveys, systematic consultations, co-operation with privately managed construction industry databases, and econometric modelling.

Recommendations (Abbreviated)

- The report's recommendations address:
 1. *Supporting the Professional Work Force*
 2. *Architecture and Engineering Professions in the Built Heritage Sector*
 3. *The Built Heritage Sector and the Construction Industry*
 4. *Rectifying Data Deficiencies*
 5. *Maintaining Momentum*

2. Introduction

This study was requested by the Cultural Human Resources Council in partnership with Human Resources and Skills Development Canada (HRSDC). The study builds on previous work undertaken by the Heritage Canada Foundation (HCF). The HCF study observed that “during the last three decades, a work force of built heritage preservation professionals and tradespeople has emerged in Canada.” However, “[this] cohort of trades and professional heritage conservation workers is not adequately recognized or understood.”¹ Indeed, the scope of the built heritage sector, itself, is difficult to define, since ‘heritage’ is an evolving concept. Before a human resource strategy can be framed, progress must be made on defining the built heritage sector and mapping the built heritage work force.

The approach taken in this study is based on interviews and workshops with stakeholders in the built heritage sector, a review of other published studies and statistical sources, and a preliminary scan of practices in other jurisdictions. The report understands the built heritage sector as being significantly more than the work force that is directly engaged in restoring and maintaining heritage structures. Chapter Four describes the built heritage sector as a continuum with identifiable stages. The first stage in this continuum involves the formulation of policies and applied research. The next stage is interventions to repair, conserve, restore or adapt heritage structures. The final stage involves maintenance and management of those structures and, where relevant, cultural and interpretive programming related to the structures. Based on this understanding of what constitutes the built heritage sector, some 40+ occupations or families of occupations have been identified as pertinent to the built heritage sector. Some of these occupations are central to the built heritage sector. Others have an impact on the sector, but are not primarily built heritage occupations.

Brief profiles of all of the occupations engaged with the built heritage sector are set out in Appendix E. These profiles provide a capsule description of the occupation’s role in the sector, identify issues related to occupational standards or regulation, and indicate how the occupation links up with the National Occupational Classification (NOC) system. These occupational profiles are far less detailed than formal ‘job descriptions.’ Their purpose is to convey a general sense of role, responsibilities and qualifications. Further work on occupational standards pertaining to any of these occupations would require a more detailed examination of the role, responsibilities, functions and qualifications required, as well as a more focussed validation procedure to ensure the accuracy of the descriptions. Nevertheless, the occupational profiles in Appendix E, together with an understanding of the structure and dynamics of the built heritage sector, do provide a basis for recommending strategic priorities for strengthening the sector’s human resources.

PRISM ECONOMICS AND ANALYSIS and BARRY PADOLSKY ASSOCIATES INC., Architects wish to express their appreciation to the members of the Steering Committee and to the many persons in the built heritage sector who contributed their time and offered valuable advice.

1 Heritage Canada Foundation, *Human Resource Issues in the Preservation of Heritage Buildings: Research Report*, 2003, p 23

3. The Built Heritage Sector: Scope and Trends

Our built heritage is the physical manifestation of our communities' collective past. *Canada's built heritage consists of structures and sites recognized by public authorities for defined characteristics on the basis of their architectural, historical and community significance.* Although age is nominally a factor in recognizing a heritage structure, with public authorities often setting a forty or fifty-year age as a qualifying criterion, the age factor is a constantly changing variable.

Fundamentally, heritage buildings and sites relate to all aspects of human settlement and habitation, including residential, institutional, commercial and industrial properties. *Built heritage embraces all sizes and classes of structure, from the "high-style" architecturally-designed buildings to the vernacular buildings constructed without formal plans, using traditional methods and materials. In addition to individual structures and sites, built heritage can also include clusters of buildings, historic districts or may be part of a cultural landscape.*

Legislative and government action to protect historic places began in Canada following the First World War. Since the 1960s, federal and provincial/territorial statutes, municipal by-laws, regulations and policies have constituted the official mechanisms by which recognition has been given to heritage structures. The scope, number and types of these regulatory tools have expanded greatly over the past forty years. Heritage conservation laws provide the principal authority for the recognition and protection of built heritage, often through a 'designation' procedure.

All governments - municipal, provincial, territorial, federal, have developed a range of incentive programs to promote heritage conservation. These include: grants, municipal and provincial tax relief programs, sales tax relief programs, and federal financial incentive programs. Governments also use their regulatory powers to protect heritage properties through project review, zoning, planning and in certain instances, through the adoption of building codes that specifically reference built heritage. Governments and heritage conservation stakeholder organizations also actively promote our built heritage as an opportunity for the future economic expansion through tourism, community renewal and 'smart growth.'

Our built heritage engages businesses and the community. A small but increasing number of property developers are actively involved in heritage conservation projects. As this report will describe, there are a growing number of professionals and tradespersons who are specialized in heritage conservation. Supporting this work are heritage stakeholder organizations that actively promote heritage values at the national, provincial and community level.

From a modest and fragmented beginning, built heritage has evolved into a distinct sector engaged in the social cultural, economic and physical development of communities in Canada.

Canada's built heritage includes:

- the pool of historic sites and structures managed by all three levels of government or their associated heritage bodies,
- the pool of sites and structures (both public and private) currently registered with heritage bodies at the federal, provincial or municipal level,
- other public buildings or districts constructed approximately 40 years prior which have architectural or historical significance,

- certain types of civil structures constructed approximately 40 years prior, e.g., bridges, which have architectural or historical significance,
- privately owned, non-residential buildings constructed approximately 40 years prior which have architectural or historical significance,
- residential buildings constructed approximately 40 years prior which have architectural or historical significance,
- landscaped space associated with heritage structures,
- some structures (private and public) constructed more recently which reflect particular architectural qualities.

The Canadian Register of Historic Places (CRHP) currently lists over 1,200 historic places. However, the CRHP estimates that as many as 20,000 historic places may meet its criteria for registration.² Various provincial and municipal registries also include many more listed sites. One estimate put the number of heritage buildings or sites under some degree of legal protection at 158,296 in 2000.³ A study for CMHC estimated that in 1997, 15.1% of dwellings were constructed prior to 1941. Of these, two-thirds were built before 1921. We have no reliable basis for estimating what proportion of these pre-1941 residential structures should be classified as heritage structures. An earlier CMHC study found that, that 38.4% of pre-1941 dwellings were in need of major repair, suggesting that there is a considerable degree of deterioration in the pre-1941 housing stock.⁴

In 1999, the Department of Canadian Heritage commissioned a review of heritage buildings that are listed in the *Canadian Inventory of Heritage Buildings*. Based on a sampling of these buildings, the review concluded that 20% of the buildings had been lost since the 1970's. The rate of loss was significantly higher in commercial buildings in larger urban centres.⁵

Park's Canada's *Standards and Guidelines for the Conservation of Historic Places in Canada* describes the types of work related to built heritage sites. This terminology is now widely used in the built heritage sector.

2 Canada's Historic Places: <http://www.historicplaces.ca>

Parks Canada - *Standards and Guidelines for the Conservation of Historic Places in Canada* defines a *historic place* as "a structure, building, group of buildings, district, landscape, archaeological site or other place in Canada that has been formally recognized for its *heritage value*." *Heritage value* is defined as "the aesthetic, historic, scientific, cultural, social or spiritual importance or significance for past, present or future generations. The heritage value of a historic place is embodied in its character-defining materials, forms, location, spatial configurations, uses and cultural associations or meanings."

3 Margaret Carter, *Towards a National Trust*, Proceedings, Heritage Canada Foundation Conference, September 14-17, 2000 Calgary p 32

4 CMHC, *Research and Development Highlights*, October 1991, p 2

5 Heritage Canada, *CIHB Revisited*, 1999. Heritage Research Associates

Conservation*

Conservation comprises all actions or processes that are aimed at safeguarding the character-defining elements of a cultural resource so as to retain its heritage value and extend its physical life. This may involve *preservation*, *rehabilitation*, *restoration*, or a combination of these actions or processes. Reconstruction or reconstitution of a disappeared cultural resource is not considered conservation.

Character-defining elements are the materials, forms, location, spatial configurations, uses and cultural associations or meanings that contribute to the heritage value of a historic place, which must be retained in order to preserve its heritage value.

Heritage value is the aesthetic, historic, scientific, cultural, social or spiritual importance or significance for past, present or future generations. The *heritage value* of a *historic place* is embodied in its character-defining materials, forms, location, spatial configurations, uses and cultural associations or meanings.

A *historic place* is a structure, building, group of buildings, district, landscape, archaeological site or other place in Canada that has been formally recognized for its *heritage value*.

Preservation

Preservation is the action or process of protecting, maintaining, and/or stabilizing the existing materials, form, and integrity of a *historic place* or of an individual component, while protecting its *heritage value*. *Preservation* can include both short-term and interim measures to protect or stabilize the place, as well as long-term actions to retard deterioration or prevent damage so that the place can be kept serviceable through routine maintenance and minimal repair, rather than extensive replacement and new construction.

Rehabilitation

Rehabilitation is the action or process of making possible a continuing or compatible contemporary use of a *historic place* or an individual component, through repair, alterations, and/or additions, while protecting its *heritage value*. *Rehabilitation* can include replacing missing historic features. The replacement may be an accurate replica of the missing feature, or it may be a new design that is compatible with the style, era, and character of the historic place.

Restoration

Restoration is the action or process of accurately revealing, recovering or representing the state of a historic place or of an individual component, as it appeared at a particular period in its history, while protecting its *heritage value*. Restoration includes the removal of features from other periods in its history and the reconstruction of missing features from the restoration period. Restoration must be based on clear evidence and detailed knowledge of the earlier forms and materials being recovered.

Maintenance

Maintenance is the routine, cyclical, non-destructive actions necessary to slow the deterioration of a *historic place*. It entails periodic inspection; routine, cyclical, non-destructive cleaning; minor repair and refinishing operations; replacement of damaged or deteriorated materials that are impractical to save.

* This definition of “conservation” is generic in that it applies to more than built heritage structures.

Adaptive use and *expansion* are also aspects of work in the built heritage sector. Adaptive use consists of altering a structure or its components with a view to modernizing its use, but maintaining as far as practical character-defining features of the structure. Adaptive use may involve, in particular, modernization of mechanical systems. Expansion involves the extension of a structure with a view to adding to its capacity, but maintaining key features of the original architectural and aesthetic character.

Based on interviews, workshops and other research, there are a number of developments or trends that bear comment. These developments and trends are affecting the built heritage sector and will ultimately affect both the number of persons who work in that sector, the skills they require, and the professional or occupational standards expected of them. Some of these trends are positive, others are negative.

“Over the past 20 years, people have become more conscious of the sector give more consideration to it. The changes are significant. but not enormous.”

Architect, Québec

“There is a general increase in preservation work, but it is not always strict conservation. It is frequently adaptive use. Compared to the 70s there is now an assumption that a building should be saved.”

Heritage Consultant, Ontario

- 1 Although views are not unanimous, *the majority of persons interviewed for this study believe there has been a discernible, though modest, increase in the amount of work undertaken in the built heritage sector.* Since there is no national inventory of built heritage structures, especially structures in private ownership, we do not have a baseline for making quantitative estimates of changes in the amount work associated with built heritage structures. There are many private developments which are preserving original facades and common spaces, while modernizing other aspects of buildings. These trends are affecting both residential and non-residential structures.

“There is a definite increase in work due to Historic Places Initiative. This was the most important infusion of dollars in the last few years. Yes there has been more rehabilitation.”

Heritage Consultant, British Columbia

2. The Federal government’s *Historic Places Initiative* is a broadly-based federal-provincial collaboration to strengthen strategic approaches to preserving built heritage, encourage increased awareness of historic places and build a broad culture of conservation in Canada. HPI was launched in 2001. The 2005 Federal Budget confirmed ongoing funding for core heritage conservation programs. These include: the Canadian Register of Historic Places, *Standards and Guidelines for the Conservation of Historic Places in Canada*, and the development of a Certification Program supporting the implementation of the Commercial Heritage Properties Incentive Fund (CHPIF). In 2003, the federal government launched CHPIF to provide financial assistance to businesses that meet certain criteria and are housed in designated heritage properties. The Fund provides assistance up to 20% of the costs of conservation work, to a ceiling of \$1 million. Access to the fund links to the Register of Historic Places and the *Standards and Guidelines*. Ongoing HPI work includes the development of proposed federal heritage conservation legislation, programs enabling aboriginal communities to fully engage

in the recognition of historic places, proposals to increase funding for the National Cost Sharing Program for National Historic Sites, and the development of proposals for a “national trust” adapted to the context of the Canadian heritage conservation sector. The HPI has altered the terms of discourse about the built heritage sector in two ways. First, the HPI is a systematic approach to the challenge of preserving built heritage. In that respect, the HPI is a pan-Canadian collaboration that has engaged all jurisdictions and heritage stakeholders. HPI is a broad strategic framework that supercedes the patchwork quilt of policies and programmes that previous existed within and between jurisdictions. Second, the HPI explicitly acknowledges the need to link built heritage preservation to private sector developments. The HPI seeks to leverage private development, rather than simply restrict it.

“The systems of regulation, inspection and verification that operate in the built heritage sector in Europe and in the United States are more strict and enable work to be done to a higher standard.”

Workshop Participant, Montreal

3. New legislative frameworks are emerging which will strengthen governments, especially local governments, in their negotiations with private developers over the re-development or demolition of heritage structures and heritage districts. For example, in Ontario, recently proposed amendments to the Ontario *Heritage Act* will give the province and municipalities new powers not only to delay, but to stop demolition of heritage sites. In 2000, the Arpin report recommended a new and systematic legislative and organizational strategy to deal with heritage in Quebec. The report assigned particular importance to the built heritage sector.⁶ Notwithstanding these developments, legislative and financial support for the built heritage sector is generally weaker in most parts of Canada than in many other jurisdictions, including the United States.

“There has been an enormous shift of gears with much more retro-fitting, beginning in the 1990’s... Previously there was a much smaller private market for restoration... Now heritage structures are being used more for condo developments... It has reached the point where new buildings are mimicking old buildings.”

Architect, Ontario

4. In many parts of the country, there has been a noticeable increase in the adaptive use of heritage buildings. The best protection of a historic place is to find an ongoing use of the historic place in the life of the community. Through HPI, there is firm a clear focus on the adaptive reuse of historic places that are undertaken in manner that respects the heritage value and the character defining elements of historic places. Mechanical systems and interior features can be modernized in a manner that respects the heritage value of the historic place. Additional features may be added that are judged to respect the heritage values of the historic place and the original structure may also be expanded through compatible but subordinate additions.

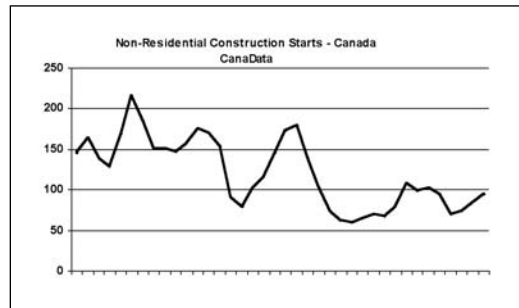
6 Notre patrimoine, Roland Arpin, rapport du Groupe-conseil sur al Politique du patrimoine culturel du Québec <http://www.politique-patrimoine.org/>

“We are going to see more post-1945 buildings become ‘heritage.’”

Heritage Planner, Manitoba

5. *Increasing numbers of post-1945 structures will be viewed as heritage buildings.* Building materials and designs in the post-1945 period also differ from those of earlier structures and therefore require different preservation and restoration skills. In Quebec, the Arpin Report stressed that heritage is an evolving concept.

6. *Notwithstanding favourable developments in built heritage policy, demolition continues, albeit at a slower pace, in many parts of the country.* Many built heritage structures occupy land which can be profitably developed by erecting larger structures that incorporate modern efficiencies. This is especially true of inner city industrial districts that can be re-developed for mixed commercial and residential use. Being tied to



the investment cycle, re-development (and demolition) occurs in waves. In most regions of Canada, since the end of the 1980’s boom, there has been a significant drop-off in non-residential construction starts. It remains to be seen whether this lower level of non-residential construction activity represents a long-term shift to a lower plateau or whether we will see a return to previous levels of new construction (and, by inference, previous levels of demolition.) Equally, we do not know if the current propensity to restore older structures is attributable to a permanent shift in development patterns or simply reflects the overall decline in non-residential construction activity. *Heritage Canada estimates that between 1970 and 2000, larger population centres lost 21% of their heritage structures, while smaller centres lost 23%*

7. In response to fiscal pressures, *governments are divesting their real estate assets.* This change in ownership removes many heritage structures from the review processes that apply to publicly owned buildings. As well, private owners may wish to eliminate heritage features that are costly to maintain or repair.
8. Among many urban planners, there is a greater understanding of the relationship between commercial re-generation and the preservation of heritage sites and heritage districts. There is also a greater appreciation of the importance of preserving built heritage for tourism purposes.⁷ For example, in its official Heritage Plan, the City of Ottawa states:

“Heritage properties have particular economic impact as demonstrated by the recent efforts of many cities that have encouraged or spearheaded the renovation of historic buildings and areas. Historic resources may be considered a means rather than an end. Historic preservation is a vehicle to achieve a wide range of important goals: economic development, downtown revitalization, neighbourhood reinvestment, tourism attraction and community building. Investing in heritage properties and facilities makes them attractive for public and private partnerships and for wider community use.”⁸

⁷ Heritage Canada Foundation, *Packaging the Potential: Discovering Heritage Tourism – Practical Ideas for the Tourism Industry* (Canadian Tourism Commission and Heritage Canada Foundation), 2004

⁸ City of Ottawa, *Heritage Plan, Ottawa 2020* http://ottawa.ca/city_services/planningzoning/2020/heritage/toc_en.shtml

9. While still comparatively few in number, there are now more *university and college programmes that focus on heritage work*. At the trade level, one of the key trades in the built heritage sector – bricklayers/masons – is developing a specialized curriculum in restoration masonry. Algonquin College in eastern Ontario has also established a programme in heritage trades. A heritage carpentry programme has been started by the College of the North Atlantic in Newfoundland.

“The impact of building codes is huge. There has been no careful or systematic consideration of traditional materials in comparison with new materials.”

Workshop Participant, Toronto

10. *Building Codes, which were previously prescriptive have moved, in some measure, towards objective-based standards*. Objective-based standards can be more accommodating to traditional building materials, though there are still a significant number of areas where codes are at odds with traditional building materials and traditional design methods. Building Codes are particularly important in private sector developments when a heritage structure is being adapted for new uses. Objective-based building codes may also make it less difficult to obtain insurance at reasonable rates.
11. *There is increased appreciation of the link between the environment and new construction*. Environment Canada estimates that approximately one-third of the waste in land fills is construction waste from new construction and from demolition. Restoration of structures and preservation of components reduces this flow of construction waste into landfill sites.

“The low bid system can cause serious problems in built heritage.”

Workshop Participant, Toronto

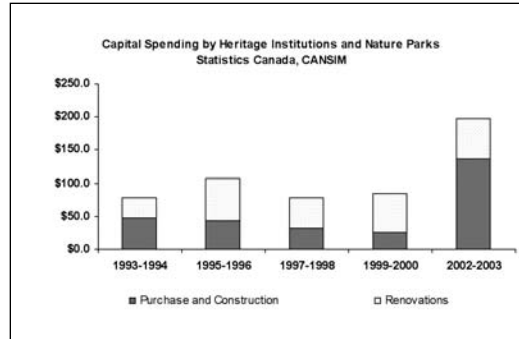
12. *The reliance on low bids often results in restoration work being undertaken by architects, engineers and contractors who lack an adequate understanding of the distinctive skills required for work on built heritage sites*.

“The primary issue for the sector is transforming the attitudes of government officials (especially local government officials) and property developers. This will require more incentives to encourage adaptive re-use of older structures.”

Architect, Ontario

13. Notwithstanding the progress that has been made, there continues to be a lack of understanding of the economic value of heritage properties on the part of many urban planners, real estate brokers, property developers, conventional lenders, and insurance underwriters.

14. *During the 1990's, there were significant reductions in both maintenance support for heritage structures and in capital expenditures.* The 2003 report of the Auditor General estimated that in real terms (i.e., netting out the effect of inflation), federal support for historic parks and sites and other heritage resources declined by 22% over the period 1990-91 to 2000-01. The Report also noted that in February 2000, an internal survey showed that two-thirds of the heritage buildings in the federal portfolio were in poor to fair condition.



In recent years, however, there has been a noticeable increase in capital support. Capital spending on heritage institutions (including parks) by all levels of government has more than doubled. The 2005 Federal Budget included \$209 million in new funding for Parks Canada to repair and replace its ageing national park and national historic site visitor facilities, to restore its national historic sites, several of which are experiencing age-related deterioration and structural problems, to repair, replace and improve its critical infrastructure, including through highways, and to update its interpretive displays and programs.

“There are many pathways into the sector, but there is a growing professionalism and a growing recognition of a need for education and training, especially around principles and the policy environment.”

Workshop Participant, Victoria

15. Many of the persons who were interviewed or who participated in the workshops expressed the sense that there has been an increase in the number of persons who work in the built heritage sector either substantially or exclusively. *There is also a growing sense of professionalism* among these persons – a trend that is reflected in the importance that is attached to such bodies as the Association for Preservation Technology (APT), the Canadian branch of the UNESCO-affiliated International Council on Monuments and Sites (ICOMOS) and the Canadian Association of Professional Heritage Consultants (CAPHC). The latter was established in 1987 and accepts members, based on demonstrated experience in the sector. Notwithstanding these developments, *there is a strong sense that the need for professional advice on designing and managing interventions in the built heritage sector is not sufficiently understood.* This often results in avoidable losses or damage to the heritage stock. The seriousness of this challenge cannot be underestimated. As one participant in a workshop observed of heritage structures or heritage features: “once it’s gone, it gone.”

On balance, the trends and developments discussed above are more positive than negative. This view is not shared by all persons who were interviewed or who participated in workshops. However, a favourable interpretation of trends is by far the more commonly held view. Nevertheless, the trends described do not add up to a dramatic change for the built heritage sector. The impressions that emerge from our research and from interviews and workshops are:

First, *the built heritage sector is expanding slowly*, but is constrained by a policy environment, which though improving, is still notably less supportive than in many other jurisdictions.

Second, *the expansion of the sector has highlighted human resource problems and made it more pressing to deal with these problems*. While these human resource problems do not constitute a crisis, in the absence of specific steps to address them, the problems will grow more serious and will become a much more serious constraint on the sector.

Third, *the sector's human resource requirements are inextricably tied to the policy and funding environment*. In the past, human resources have not occupied a central place in policy discussions. This is no longer appropriate. The success of heritage policies depends on the availability of an appropriately skilled work force.

4. Overview of Human Resources in the Built Heritage Sector

Distinct Sector

“The skills needed to restore a building are different from the skills needed to erect it in the first place. Restoration skills are not the same as new construction skills.”

Workshop Participant, Halifax

Our point of departure is that *the built heritage sector is distinct from new construction and ordinary renovation and repair*. In many occupations, the skills in the built heritage sector required of professionals, technicians and skill tradespersons overlap with the skills required in new construction and ordinary renovation and repair. However, the differences between the two sectors are at least equally important.

“Restoration of built heritage structures is completely a different world from regular construction.”

Workshop Participant, Montreal

- *Construction methods, materials, and aesthetic principles may be unfamiliar are markedly different in the built heritage sector.* Consequently, an understanding of the historical context is critical to all aspects of work in the built heritage sector. Without this understanding, irretrievable errors will be made. Because the construction methods, construction materials and aesthetic principles are different, so also are the requisite design skills for architects and requisite trade skills for skilled tradespersons.
- Conservation is the *raison d'être* of the built heritage sector. *Repair, restoration and appropriate conservation methods are key.* By contrast, in new construction, replacement of worn or degraded components is the norm.

“First, one must respect what is already there.”

Workshop Participant, Montreal

- *On site customization of components is much more common in built heritage structures than the use of pre-fabricated components.* For many construction trades, this implies a shift of work from the “shop” to the construction site. This reverses the trend that has been evident in many trades in new construction where greater reliance on pre-fabrication is one of the major methods of achieving higher productivity in the industry.
- In addition to distinct trade skills, *the built heritage sector also requires distinct craft skills*, such as leaded glass repair and stone carving, which have virtually no application in new construction.
- Owing to the need to respect traditional building methods, materials and aesthetic principles, construction work in the built heritage sector is *more labour intensive and requires longer time frames for completion*. Project managers, contractors, and cost consultants who are unfamiliar with the built heritage sector are at great risk of underestimating the time and resources required and subsequently being compelled to “cut corners” to remain within their planning and budgeting parameters.
- *In addition to knowing Building Code requirements, professionals, technicians and tradespersons working in the built heritage sector must also be familiar with conservation and preservation standards.* Of particular importance are the Parks Canada *Standards and Guidelines for the Conservation of Historic Places in Canada*. The *Standards and Guidelines* have a general significance for the sector, but are particularly important for work that is undertaken on designated heritage sites and on projects that access federal support under the Commercial Heritage Properties Incentive Fund. It is also important for professionals to be familiar with ICOMOS standards and guidelines and with the standards adopted by their professional bodies.

- *In contrast with new construction, philosophy plays a key role in conceiving and executing heritage projects. Understanding the philosophy behind preservation and conservation is important to the integrity of the sector.* Preservation philosophy permeates all aspects of design and implementation on a built heritage project. Professionals, technicians and tradespersons who do not understand preservation philosophy risk carrying out their functions in a manner that diverges from a project’s goals and purposes.
- *Unlike new construction, in the built heritage sector, errors are irrevocable.* If a heritage feature is removed or destroyed, it cannot be replaced.

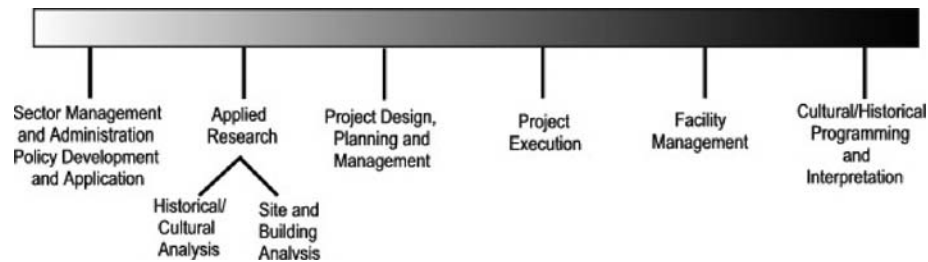
Many of the occupations that play key roles in the built heritage sector exist within the scope of occupations whose focus is new construction and ordinary repair and renovation. This has two consequences. First, there is a disconnect between the skill needs of the built heritage sector and the training that individuals receive. And second, it is difficult to estimate from conventional data sources the number of persons who have the specialized skills needed by the built heritage sector and who derive all or a significant portion of their livelihood from working in that sector. These measurement difficulties, however, should not detract from our fundamental point of departure: *the built heritage sector is distinct from both new construction and ordinary renovation and repair and requires skills that are unique to that sector.*

The Built Heritage Sector Work Force

The built heritage sector involves much more than interventions to conserve, preserve, rehabilitate or restore a heritage structure. Figure No. 1 portrays the built heritage sector as a continuum. The stages that are represented along the continuum often overlap with one another. In many cases, individuals and occupations may be associated with more than one stage.

Figure No. 1

Built Heritage Sector Continuum



- *Sector Management and Administration / Policy Development and Application* comprises those professional functions related to developing regulatory and policy frameworks, applying regulations and policies to specific applications that involve approval requirements, and undertaking analytical and consulting studies pertinent to policy and strategy as well as programme planners.
- Applied Research encompasses two distinct types of research and analysis. The first pertains to the cultural or historical significance of a particular historic place. The second entails the physical examination of a site to obtain the technical information necessary for devising a strategy for preservation, restoration, rehabilitation, expansion, etc.
- Project Design, Planning and Management involves the development of a specific plan for preserving, restoring, rehabilitating, expanding, or adapting the use of a heritage site.
- Project Execution entails the implementation of a design plan. Project execution skills are predominantly those associated with various branches of the construction industry, including architects, engineers, contractors and skilled tradespersons.

- Facility Management involves developing and implementing a preventive maintenance programme and general asset management plan for a historic place.
- Cultural and Historical Programming and Interpretation entails developing and delivering content programming pertinent to a project and producing interpretive materials to communicate a site's cultural or historical significance.
- Educators are not formally involved in designing and administering policies or managing interventions. However, educators in the college and university system play a key role in developing the sector's human resources.

The work force of the built heritage sector comprises two types of occupations. The first are occupations whose incumbents derive all, or the preponderance, of their livelihood from working in the built heritage sector. These occupations may be thought of as specific to the built heritage sector. The second type of occupation comprises those occupations whose incumbents undertake some work in the built heritage sector, either by choice or because aspects of the sector fall within the general purview of their responsibilities. Figure No. 2 sets out a list of these two occupational groups. The list of occupations that are not specific to built heritage could be substantially longer, including such occupations as real estate agents, property developers, lawyers, insurance underwriters, loan managers, university and college faculty, etc. We have restricted the list to those occupations where there is often a frequent involvement in the built heritage sector. The occupational profiles in Appendix E are more detailed.

Figure No. 2

OCCUPATIONS THAT ARE SPECIFIC TO THE BUILT HERITAGE SECTOR AND OCCUPATIONS WHICH ARE NOT SPECIFIC TO THE BUILT HERITAGE SECTOR

Sector-Specific Occupations	Occupations that are Not Specific to the Sector
<ul style="list-style-type: none"> • Heritage Policy Administrators • Heritage Programme Administrators • Heritage Site Managers and Administrators • Heritage Consultants • Architectural Historians • Building Historians • Historical Geographers • Historians (<i>outside of universities and colleges</i>) • Heritage Architects & Heritage Architectural Technologists • Heritage Tradespersons • Heritage Craftpersons (<i>e.g., leaded glass, stone carving</i>) • Conservators and Conservator Technicians* • Archaeologists and Archaeology Technicians* • Urban Planners 	<ul style="list-style-type: none"> • Engineers (<i>various disciplines</i>) • Various types of Technologists (<i>e.g., materials testers, photogrammatrists, building recorders, etc.</i>) • Non-specialist Architects • Landscape Architects • Interior Designers • Engineering and Architectural Technologists • Cost Consultants / Quantity Surveyors • Project Managers • Contractors • Construction Tradespersons • Marketing specialists

* also work outside the built heritage sector

The human resource issues are fundamentally different for specialized and non-specialized occupations. For specialized occupations, the key issues are:

- recognition,
- the adequacy or appropriateness of occupational regulation,
- the adequacy of supply,
- the adequacy of training,
- the adequacy of professional development opportunities.

“There is a built heritage industry, but it is a loose affiliation of individuals who mostly know each other’s work.”
Heritage Consultant, Ontario

For non-specialized occupations, the key human resource issue is the degree to which persons in these occupations understand the built heritage sector and adjust their professional practices appropriately. In some instances, it may be appropriate to consider the qualification requirements to work in the built heritage sector, although the practicality of this will vary by occupation and, in some instances, by region.

The community of persons in specialized built heritage occupations is comparatively small. Figure No. 3 sets out our estimates of the number of persons in specialized occupations working wholly or preponderantly in the built heritage sector. These estimates are best described as guesses that are informed by the comments of participants in our interviews and workshops. We have no basis on which to estimate the number of persons in non-specialized occupations who occasionally work in the built heritage sector or whose work impinges on the sector.

Figure No. 3

ESTIMATE OF PERSONS IN SPECIALIZED OCCUPATIONS IN THE BUILT HERITAGE SECTOR

Heritage Institutions (Public and Non-Profit) ⁹	2,500 to 3,000
Governments (Policy and Programme Administration) and Heritage Organizations	300 to 500
Professionals (private sector)	300 to 500
Heritage Crafts	200 to 300
Heritage Trades	500 to 1,000
Total	3,800 to 5,300

With respect to construction related work, we can offer some rough estimates. Statistics Canada reports that in 2004, heritage institutions¹⁰ incurred approximately \$254 million in capital expenditures. Construction employment related to these capital expenditures was probably around 2,200 persons.¹¹ Perhaps another 200-300 persons were employed in a professional capacity related to these capital expenditures. If fully utilized, the Commercial Heritage Properties Incentive Fund (CHPIF) could generate approximately 1,000-1,200 additional construction and other jobs. We have no means of estimating either the magnitude or the number of persons who worked on privately financed undertakings, whether residential or non-residential, outside of the purview of CHPIF. While there are data on renovation and repair expenditures, we have no basis for estimating the share of those expenditures that pertained to heritage structures. Indeed, data are lacking even for designated sites that are privately owned, let alone non-designated sites.

⁹ There are approximately 25,000 persons employed by heritage institutions of all types. Based on interviews we estimate that perhaps 10-15% of these persons have significant responsibilities in the built heritage sector.

¹⁰ Note that heritage “institutions” is broader than heritage buildings.

¹¹ This is based on very approximate guesses that (1) 60% of capital expenditures were for construction labour, (2) the labour co-efficients are around 25,000 hours per \$1 million of expenditure, and (3) for persons in the construction industry, employment averages 1700 hours per year. These are higher labour ratios and labour co-efficients than would be applied to new construction. This reflects the greater labour intensiveness of built heritage work.

Human Resource Issues

Formal Professional Training:

“There are few full-time openings in Canada for our graduates. About 35% of our students are from outside Canada. Our program would not be sustainable on Canadian enrolments alone.”

Professor – Specialized University Program

“In some disciplines, there are problems retaining people owing to the lack of work.”

Workshop Participant, Halifax

In light of the comparatively small number of persons who are engaged full-time in the built heritage sector, it is not surprising that many universities and colleges have difficulty in attracting a sufficient number of students to sustain specialized programmes dealing with the built heritage sector. Employment prospects in the sector will not support any significant increase in full-time enrolments. This is likely to mean that many practitioners will obtain their advanced qualifications outside Canada. Obtaining foreign qualifications has been a common pattern in the past. It is likely to remain so.

Professional Development:

In the built heritage sector, professional development for the incumbent work force is at least as important, if not more important, than training new entrants. Not surprisingly, therefore, many professionals, especially those employed in the public and non-profit sector, identified professional development training as an important concern.

Professional development training is currently available through the University of Victoria and the University of Montreal, as well as through professional associations. Organizations such as the Association for Preservation Technology and the Canadian Conservation Institute also provide multi-disciplinary training. Parks Canada offers a number of specialized courses, although its resources are limited. We were told that “every course [offered by Parks Canada] is a sell-out and many have waiting lists.” The federal government’s Historic Places Initiative was cited as having had an important effect in increasing the demand for professional development training.

Resources for professional development have not always been sufficient. More importantly, there may not have been a sufficient recognition of the importance of professional development training in the public and non-profit sector. While there is evidence that this is changing, support for professional development training still falls short of the sector’s needs. *The sector needs a general review of its professional development requirements and the institutional and financial resources that are available to meet those requirements.* Such a review will significantly strengthen the sector’s understanding of its human resource needs.

Organizational Gap:

Within the built heritage sector there are both discipline-based and multi-disciplinary organizations. Most professionals in the sector have a “home discipline” and maintain membership in the professional association related to that discipline. It is also common for professionals in the sector to belong to multi-disciplinary bodies, such as the Association for Preservation Technology. The Canadian Association of Professional Heritage Consultants has a significant multi-disciplinary membership, drawn largely, though not exclusively from professionals offering specialized services to the sector. *A significant gap in the sector’s organizational fabric is an organizational “home” for professionals who are employed in the public sector and by heritage institutions in the non-profit sector. These professionals, whom we estimate to number approximately 2,500 to 3,000 persons, have a number of common interests that currently do not find sufficient organizational expression.* Among these common interests are the need for professional training, the need to keep abreast of developments in the program and policy field and the need to have an organized interaction with professionals in other fields, such as urban planning, who can have a significant impact on the built heritage sector.

Professional Recognition:

“Recognition of skills is a bigger problem than skill shortage.”

Workshop Participant, Halifax

A recurring theme among persons interviewed, or who participated in workshops, was the need for greater recognition of the sector and for the contribution made by persons who work in the sector. At the root of this concern are two related perceptions. The first is that the role and skills of professionals in the built heritage sector are not understood by others (planners, developers, project managers, contractors) who make decisions that can impinge profoundly on the sector. The second, and related perception, is that many tasks in the built heritage sector, indeed sometimes entire projects, are undertaken by persons who have either no knowledge or insufficient knowledge of conservation standards or techniques. Components of a building or ornamentation may be unnecessarily replaced or damaged. The result is that much of the heritage character of a structure is unnecessarily lost. Professional recognition is a circular problem. As long as key actors in the built heritage sector, such as planners, developers, project managers and contractors, lack an understanding of conservation standards they will not seek out professionals who are expert in the application of those standards. The fact that restoration and conservation work is then done by persons who are poorly equipped for these tasks only compounds the problem of professional recognition. Indeed, it reinforces the view among project managers, developers, *etc.* that no special skills are required and that restoration skills are no different than new construction skills. Something must be done to break into this circular problem and promote a more constructive dynamic in the sector.

Succession Planning/Portals of Entry:

“There is no commitment to recruit younger people into built heritage professions. Many people in the sector are ready to retire. There is nobody to replace them.”

Curator, Victoria

“In government, there is no succession plan. We will have difficulty replacing the current expertise. Cost prevents the initiation of mentoring programs in government.

Workshop Participant, Victoria

Many persons who were interviewed, or who participated in workshops, stressed the importance of practical experience. They also expressed concerns about replacing experienced professionals who are approaching retirement. The central importance of practical experience creates a problem for the sector. Sectors, such as built heritage, which rely heavily on experience are best able to provide that experience to new entrants when the sector is expanding rapidly or has a high rate of turn-over. Neither of these conditions applies to the built heritage sector. In the absence of rapid growth or a high rate of turn-over, there are few entry-level jobs. *The sector therefore may have a serious and difficult succession challenge.* The built heritage sector cannot rely on the post-secondary system to train graduates who are qualified to step immediately into the shoes of retiring professionals. Nor can the sector rely on employers in the sector to open up a sufficient number of entry-level positions to meet future skill needs in the sector. Left to its own devices, the labour market will not alleviate this problem. *Without deliberate measures, the sector may go through a period when there is a diminution of the skill pool.* How serious is the risk? In the absence of a more careful demographic analysis, we cannot offer a reliable estimate. However, the indication from interviews and workshops is that the risk should be taken seriously.

Occupational Standards and Certification for Professionals:

As indicated in Figure No. 3, a reasonable estimate of the number of persons who work in specialized built heritage occupations would be somewhere in the range of 3,800 – 5,300 persons. This is a comparatively small labour market. It is likely that most professionals in a region know one another directly or by reputation. One individual interviewed for this study described the importance of a person's standing among his or her peers as equivalent to “informal certification.” We think this is an appropriate description. In general, we encountered no evidence that this “informal certification” was failing to meet the sector's needs in most fields. However, as will be noted below, there are concerns that the need for specialized “heritage architects,” “heritage engineers” and “heritage project managers” is not being met.

“The only way to gauge skill is by reputation.”

Architect, Ontario

Architects:

“There are architectural firms that specialize in built heritage. I believe that in Quebec there are at least 10 firms. However, often generalist firms obtain the contracts without the required competence to do the job correctly.”

Architect, Québec

It was noted by a number of persons that architects who only occasionally work in the built heritage sector may not be sufficiently experienced in the sector to fully understand the relevant conservation principles or the need, in some situations, for conservation specialists. As well, architects who only occasionally undertake work in the built heritage sector may not be fully aware of which trade contractors, consulting engineers and suppliers have experience in the sector. Indeed, they may not appreciate the extent to which the built heritage sector requires distinct skills and distinct materials. *While all professions in the built heritage sector play an important role, the role of architects is pivotal.* Architects are usually responsible for the design features of an intervention. As well, architects frequently manage the intervention and play a role in advising owner-clients on the selection of engineers and trade contractors. Architects may also manage projects.

Engineers:

“There are very few engineers and architects who have the skills and knowledge for the conservation of heritage structures. Many say they do, but they don’t.”

Heritage Planner

“To engineers, ‘restoration’ means recover the function, while to a conservator, ‘restoration’ means recover the period application.”

Workshop Participant, Halifax

Civil and structural engineers must have a thorough understanding of the materials and techniques originally used in a built heritage structure. In many instances, electrical and mechanical engineers are involved in retrofitting a heritage structure with systems that were not part of the original structure. This is almost invariably the case when a heritage structure is being adapted for modern use. Among the issues that may arise in a heritage structure are problems of moisture control, protection from changes in humidity, structural integrity, and the need for vibration control. Engineers may also be biased towards replacing or altering features of heritage building that are important to its heritage character. Engineers who do not appreciate the materials and construction methods used in a built heritage structure may fail to take these into account when specifying new systems.

Project Managers:

“It is most important that the person managing the project be a specialist in restoration or conservation.

Workshop Participant, Montreal

Project management is a key function in any construction undertaking. Project managers may be engineers, architects, cost consultants, general contractors or specialized construction project managers. In the built heritage sector, architects tend to predominate in the project management function, though this is not universally the case. Many project managers acquire their skills solely through experience. For engineers and architects, project management may have been part of their undergraduate training. Accreditation by the Project Management Institute is common, though far from universal. Project managers either make or advise on key decisions regarding trade contractors, consulting engineers, suppliers and the use of conservation specialists. Project managers who do not understand the distinct skills required to work in the built heritage sector are more likely to select engineers and trade contractors who are similarly inexperienced in the sector. A failure to appreciate the more labour-intensive nature of built heritage work can lead to under-estimating time requirements and pressure to “cut corners.”

General Contractors and Trade Contractors:

“It is not always competent people who have the contracts. Sometimes a business gets a contract, but does not do a good restoration... There is also a tendency to use replacement materials instead of original materials... Real stone will last for 100 to 150 years whereas reproduction stone lasts only 20 to 25 years.”

Workshop Participant, Montreal

Trade contractors also play a key role in the execution of projects in the built heritage sector. Projects typically do not hire labour directly. Rather projects employ trade contractors who supply and supervise labour and, in some cases, may determine the materials to be used. Trade contractors who are experienced in doing work in the built heritage sector understand the need to employ tradespersons who have the distinct trade skills required by the sector. Experienced contractors also understand the more labour-intensive and time-consuming nature of work in the sector. By contrast, contractors without experience in the sector are likely to employ tradespersons who also lack experience and to underestimate the time requirements. In some regions the scarcity of experienced contractors is acute. In others, there are an adequate number of experienced contractors. Low-bid rules may result in work being awarded to inexperienced contractors if they are not excluded by pre-qualification criteria.

Skilled Trades:

“Regarding the traditional skills: carpenters-joiners, cabinet-makers, masons, roofers, and glass workers require far more skill in the built heritage sector than in the regular construction industry.”

Architect, Québec

The participants in interviews and workshops stressed the differences in the skill requirements for trades persons working on built heritage structures versus work on new construction. In the main, the occupational standards for the construction trades require little or no understanding of traditional building methods and building materials. Not surprisingly, trade standards are geared to the needs of new construction. In many regions, it was reported that it is difficult to find tradespersons who have experience in working on built heritage structures.

Crafts:

In addition to the traditional construction trades, the built heritage sector also requires craftspersons to work on stained and leaded glass, stone carving, wood carving, etc. In Quebec, the *Construction Act* requires workers on a construction site to hold certificates of competence. The legislation was amended to take account of the need for craftspersons who are outside the scope of the *Construction Act*. There are no data on the number of persons working in crafts that are relevant to the built heritage sector. Nor are there formal apprenticeship systems for continuing the skill supply.

Tracking and Measuring:

We noted earlier the challenges in formulating estimates of the size of the built heritage stock, the number of persons who work in the sector, and the amount of work associated with capital and repair expenditures in the sector. Progress must be made on dealing with these data deficiencies. This is especially important in relation to any measures that might be taken to train and qualify additional skilled tradespersons.

5. Regulation of Built Heritage in the United States

Components of The US System of Heritage Regulation

In the United States, like Canada, all levels of government are involved in the preservation of built heritage. The federal government plays an important leadership role both organizationally and through co-funding programmes. *In many respects, the US approach to the preservation of built heritage is similar to the Canadian strategy, but is more fully realized.* In three key respects, however, the US approach differs from the Canadian approach.

First, the US government maintains a more comprehensive inventory of built heritage structures and sites through national surveys and through a national registry system.

Second, from a developers perspective, the US system of tax credits is substantially more predictable than Canada's Commercial Heritage Properties Incentive Fund [both programmes provide support up to 20% of eligible costs], and

Third, *in the US, there is a system of professional qualification which is integrated with broader preservation standards and funding strategies.*

The principal sources of statutory authority for the federal government are the *Historic Sites, Buildings, and Antiquities Act of 1935*, and the *National Historic Preservation Act of 1966*. The chief components of the US approach to built heritage preservation are:

- a. the Historic American Buildings Survey and the Historic American Engineering Record (HABS/HAER – instituted under the *Historic Sites, Buildings, and Antiquities Act of 1935*,
- b. the National Register of Historic Places (NRHP),
- c. preservation standards:
 - *The Secretary of the Interior's Standards for the Treatment of Historic Properties, with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings (1995)*, and
 - *The Secretary of the Interior's Standards for the Treatment of Historic Properties, with Guidelines for the Treatment of Cultural Landscapes (1996)*.
- d. documentation standards: *The Secretary of the Interior's Standards and Guidelines for Architectural and Engineering Documentation*.
- e. National Center for Preservation Training and Technology (NCPTT) – established in 1992 by amendments to the *National Historic Preservation Act*,
- f. tax credits and grants, most importantly the 'historic preservation tax credits,'
- g. professional occupational standards: *Secretary of the Interior's Professional Qualification Standards* developed by the National Park Service
- h. the American Cultural Resources Association which is an approximate counterpart to the Canadian Association of Professional Heritage Consultants.

HABS/HAER Surveys and National Register of Historic Places

The Historic American Buildings Survey and the Historic American Engineering Record (HABS/HAER) document important architectural, engineering and industrial sites throughout the United States. HABS/HAER documentation consists of measured drawings, large-format photographs, digital rectified photogrammetry, electronic surveying and written history. HABS/HAER collections are archived at the Library of Congress. HABS/HAER is central to a strategy of “preservation through documentation.” It is the oldest federal preservation program. HABS/HAER is administered by the National Parks Service. HABS is co-sponsored with the American Institute of Architects. HAER is a collaborative undertaking with various professional engineering associations. These collaborations have provided important linkages between the built heritage sector and the architectural and engineering professional societies.

The National Register of Historic Places was authorized by the *National Historic Preservation Act of 1966*. Properties listed in the National Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. The National Register is administered by the National Park Service. There are approximately 78,000 listings in the National Register. Listing in the National Register is linked to federal assistance for historic preservation.

Federal Standards for Preservation and Documentation

In 1995 and 1996, the US Secretary of the Interior published two sets of standards – one for historic buildings and one for historic landscapes. These published standards were the basis for Parks Canada’s *Standards and Guidelines for the Conservation of Historic Places in Canada*. In 2003, the Secretary of the Interior published updated standards for documenting historic buildings, engineering installations and landscaping.

National Center for Preservation Technology and Training (NCPTT)

The National Center for Preservation Technology and Training supports research into technologies related to preservation, in particular non-invasive and non-destructive technologies. The Center also supports research into materials and, in particular, the impact of pollutants on materials. Finally, the Center also has a training mandate. The Center collaborates with the Association for Preservation Technology.

Tax Incentives

The Federal Historic Preservation Tax Incentive provides a tax credit of 20% of the amount spent on the certified rehabilitation of an historic property. Certification is administered by the National Parks Service on behalf of the Internal Revenue Service. The tax benefit is a credit against corporate incomes taxes payable, rather than a tax deduction. There is no ceiling on the aggregate amount of tax expenditures. The credit is limited to buildings which are privately owned and which are income-producing. To be eligible, properties must be (a) included in the National Register, (b) rehabilitated in accordance with the Secretary of the Interior's published standards, and (c) engage persons professionally qualified, as per the Secretary of the Interior's published standards for preservation professionals, and (d) must involve rehabilitation expenditures that exceed the value of the pre-rehabilitated building. The tax incentive has been in place since 1976. Since then, the programme has supported rehabilitation of more than 32,000 historic properties. This is almost half of the properties included in the National Register. The National Parks Service estimates that since 1976, the incentive has supported more than \$33 billion in private sector spending on the rehabilitation of historic structures. In recent years, private sector investment spending supported by the tax credit has been approximately \$3 billion annually. This implies roughly \$600 million in annual tax expenditures.¹²

Federal tax credits are mirrored in 18 states (as of 2004) which provide credits against state income tax ranging from 20-50% of the value of eligible restoration expenditures.

Professional Occupational Standards

The 1980 Amendments to the *National Historic Preservation Act* affirmed the previous regulatory requirement for professionally qualified staff. In 1982, this authority led to the development by the National Park Service of the *Secretary of the Interior's Professional Qualification Standards*. The Standards originally applied to 5 disciplines. This was subsequently expanded to 12 in 1992. The disciplines currently covered by the Professional Qualification Standards are:

1. Archaeology (Prehistoric and Historic),
2. Architectural History,
3. Conservation,
4. Cultural Anthropology,
5. Curation,
6. Engineering,
7. Folklore,
8. Historic Architecture,
9. Historic Landscape Architecture,
10. Historic Preservation,
11. Historic Preservation Planning, and
12. History.

¹² This contrasts with \$10 million available annually under Canada's Commercial Heritage Properties Incentive Fund. The usual ratio for comparing the US to Canada is 10:1. On this basis, the US tax credit system represents financial support for private investment in heritage properties that is approximately 6 times that of CHPIF.

“When decision makers lack the expertise required to make informed decisions, historic and cultural resources can be overlooked, mis-identified, mis-evaluated, damaged, or lost. Partial expertise can be just as harmful, whether a person is well-grounded in historic preservation, but lacks professional discipline skills, or, alternatively, is an expert in a professional discipline, but fails to understand its important connection to historic preservation.” [Emphasis added.]

Historic Preservation Qualification Standards, National Parks Service, United States

The Standards are intended as guidelines for bodies which are hiring, appointing or otherwise engaging professional services in the historic preservation field. However, in a number of instances, regulations or statutes reference the Standards and thereby make them obligatory. Of particular importance, *the Standards apply to work done under the Federal Historic Preservation Tax Incentives and to work done under the federal grants program.*

The Standards do not apply to entry-level applicants or to pre-eminent professionals in the field. Rather, *the Standards are designed to describe the typical expertise held by credible mid-level professional working in historic preservation.* Application of the standards requires the development of detailed job descriptions or specifications containing additional information relevant to a particular situation.

The Standards recognize two types of skills: skills that are specific to the techniques associated with the discipline and historic. Both types of skills are considered essential. The following is a general statement of the Standards. Separate descriptions are published for each of the 12 covered disciplines.

Discipline Proficiencies

- Knowledge of the history of the discipline.
- Knowledge of current theories, principles, practices, methods, and techniques of the discipline.
- Familiarity with diverse specializations within the discipline.
- Skills in applying the discipline’s techniques of practice, including critical analysis skills.
- Understanding of the discipline’s relationships with other disciplines and the ability to design and carry out interdisciplinary projects.
- Understanding of complex research questions.
- Ability to place a specific project in a broader context.
- Knowledge of current scholarly research and its applicability to a given issue. Familiarity with the process of rigorous professional peer review that occurs before work is published.

Historic Preservation Proficiencies

- Familiarity with the origins and development of the historic preservation movement.
- Knowledge of the field of historic preservation as it is practiced in the United States, including its philosophies, theories, practices, laws, regulations, policies, and standards, and relationship to the discipline as a whole.
- Ability to apply Federal and relevant State and local historic preservation laws, regulations, policies, and standards in the public and private sectors, including Federal, State, and local government agencies, and private organizations.
- Ability to apply the appropriate set(s) of the “Secretary of the Interior’s Standards for Archaeology and Historic Preservation,” and/or the National Register of Historic Places criteria.

American Cultural Resources Association

The American Cultural Resources Association (ACRA) was incorporated in March, 1995, to serve the needs of the cultural resources industry. ACRA estimates that the industry comprises approximately 500 firms which employ over 10,000 persons. These individuals work in a wide variety of fields, including historic preservation, history, archaeology, architectural history, historical architecture, and landscape architecture. ARCA focuses on the business needs of this diverse industry. ARCA maintains a public registry of consultants by areas of specialization. ARCA also posts employment opportunities. Unlike CAPHC, *ARCA's principal membership comprises only for-profit companies*. Individuals may take up associate membership. There is no membership option for non-profit and public sector bodies. ARCA does not publish competency profiles for individual occupations.

Key Themes

Three themes emerge from this overview of occupational standards and skill supply in the United States.

First, *a key role is played by the National Parks Service under statutory and regulatory authority granted to the Secretary of the Interior*. The NPS has used this authority to require adherence to published professional standards for work done under the auspices of the NPS or under the purview of tax credits administered by the NPS.

Second, *the NPS system of professional standards for heritage work operates outside the accreditation systems of professional bodies*. The NPS Occupational Standards are guidelines that must be reflected in the job descriptions or other specifications used to hire or engage professionals in conservations and restoration work on projects covered by those guidelines. In other words, the guidelines apply to the employers or engagers of conservation professionals. It is up to the employers or engagers of these professionals to determine how to apply the guidelines. In this sense, the guidelines are unilateral on the part of the NPS. They are not the result of a negotiated accreditation involving the NPS and various professional bodies.

Third, *the leverage of the NPS system of professional standards derives from its application to work undertaken using tax credits that are administered by the NPS*. Private sector work undertaken using tax credits exceeds the value of work undertaken as a result of direct expenditures by the federal government.

6. Regulation of Built Heritage in the United Kingdom and Ireland

This discussion focuses primarily on heritage regulation in the UK. A discussion of professional standards in Ireland is included as there is longstanding integration of the relevant professions in the two countries.

In UK, the statutory regime provides for grading and designating of properties as heritage assets. The degree of restriction on an owner depends on the grading of the property. The system of designation and grading and the applicable controls are currently under review. In the main, heritage assets that taken into public ownership are administered by “national trusts.” There are separate trusts for England, Scotland, Northern Ireland and Wales. Additionally there are other heritage bodies focused on particular types of historic buildings, such as churches. In many instances, the “national trusts” receive heritage properties as bequests to avoid the payment of inheritance taxes. Grants are available for heritage restoration under various programmes, notably the Heritage Economic Regeneration Scheme and the Townscape Heritage Initiative. Both of these programmes focus on depressed areas. VAT relief and accelerated write-offs (as opposed to normal depreciation allowances) are available for converting redundant space over shops for letting. These have built on the concept of various LOTS schemes (living over the shop) adopted in previous conservation-led urban regeneration projects.

The UK is considering adoption of American-style tax incentives for private owners of heritage properties. The current system in the UK, however, restricts property tax abatements to properties which are open to the public. Abatements of value-added-tax (VAT), currently at 17.5% is available for approved repairs to historic buildings.

Regulation of Technical Occupations

For trades and technical occupations, a system of National Vocational Qualifications (NVQs) applies. (In Scotland a comparable system of SVQs applies.) Sector Skills Councils, which are overseen by the Sector Skills Development Agency, devise occupational and training standards for occupations within their purview. The Sector Skills Councils are employer-led. National Occupational Standards are developed for up to five levels within an occupation. The Qualifications and Curriculum Authority (QCA) oversees this process and ensures broad commensurability across the various levels of qualification in an occupation, such that Level IV in one occupation involves approximately the same degree of training, experience and responsibility as Level IV in another occupation. Training may be delivered by private or public colleges or industry bodies. The Sector Skills Councils designate “awarding bodies” to confer NVQs. Awarding bodies may be colleges, industry bodies or professional associations. NVQs are more than diplomas. NVQs are based on specified training or equivalent experience and an assessment of work experience. Demonstrated competence in a workplace is a requirement for NVQ designation. The overall system is the responsibility of the Department of Skills and Education.

In the built heritage sector, the Conference on Training in Architectural Conservation (COTAC) has developed and received approval for NVQ standards for:

- Conservation Site Management (Level 3)
- Conservation Control (Level 4), and
- Conservation Consultancy (Level 5).

Skill standards for the conservation NVQs are explicitly based on the 1993 ICOMOS *Guidelines for Education and Training in the Conservation of Monuments, Ensembles and Sites*.¹³ NVQs are offered by the Joint Award Body partnership of Edexcel, the Chartered Institute of Building (CIOB), the Institution of Civil Engineers (ICE) and COTAC.

Regulation of Skilled Trades

In the UK, sector based training in the construction industry is delivered through the Construction Industry Training Board (CITB). Skilled trades have been incorporated into the NVQ system, described above. While occupational standards for some trades make specific reference to restoration skills, this is not generally the case. The “national trusts,” led by English Heritage, have focused on the shortage of skilled tradespersons who are competent in the application of traditional building techniques. In December 2004, CITB-Construction Skills and English Heritage formed a subordinate organization within CITB-Construction Skills known as the National Heritage Training Group (NHTG). The NHTG is effectively a sector council for the heritage trades, although it is technically a subsidiary body of CITB-Construction Skills. The NHTG is governed by a body with representatives from the major trade contractors in the heritage field, trade unions, and representatives of English Heritage and other heritage bodies.

The NHTG estimates that approximately 4% of the construction work force in the UK is experienced in traditional building techniques.

The NHTG has identified 10 heritage trades for which the development of standards and appropriate training will be a priority:

- Stone Masonry
- Carpentry and Joinery
- Roof Slating and Tiling
- Bricklaying
- Painting and Decorating
- Plastering
- Leadworking
- Steeplejacking
- Thatching
- Craft Masonry

There may be aspects of the NHTG model that could be adapted to Canadian conditions.

¹³ http://www.icomos.org/docs/guidelines_for_education.html. See Appendix E.

Regulation of Professional Occupations

Conservators:

The National Council for Conservation-Restoration estimated that in 2004 there were approximately 3,500 persons working in conservation occupations. Of these, 60% belong to the NCCR's 12 member associations and are accredited at a professional level by at least one of the 12 member associations. Effective this year, the five largest associations in the NCCR have merged to create the Institute of Conservation. The NCCR was dissolved in 2004.

The Institute of Conservation maintains a Conservation Register. The Conservation Register is *not* a listing of accredited professionals in the field. Rather the Register is a listing of private businesses in the conservation field that can demonstrate competence in various specified fields. Hence the Conservation Register includes *only* owners and managers of conservation practices, including self-employed professionals. Professional accreditation is being phased in as a requirement for inclusion in the Register.

In 2005, the Institute of Conservation will take over responsibility for conferring the designation Accredited Conservator-Restorer (ACR). This designation was previously conferred by three of the member associations of the NCCR, namely United Kingdom Institute for Conservation, Institute of Paper Conservation and Society of Archivists. ACR is the premier designation for conservators in the UK. Other accreditation schemes include those operated by the British Antique Furniture Restorers' Association, the British Association of Paintings Conservators and Restorers, the Institute for the Conservation of Historic and Artistic Works in Ireland (ICHAWI), and the British Horological Institute. To date approximately 600 persons have qualified for the ACR designation.

The ACR accreditation is based on a peer review of technical competence, demonstrated theoretical knowledge, understanding of professional ethics, and a portfolio of completed projects. Applicants are reviewed by assessors who also inspect the work that has been referenced in the application for accreditation. To maintain accreditation an individual must participate in ongoing professional development. Most individuals apply for accreditation approximately 5 years after their primary conservation training (e.g. a degree or MA), or 8 -10 years after working in conservation, including practical training.

Various bodies, such as English Heritage and Historic Scotland, Area Museum Councils and Single Regional Agencies, the Council for the Care of Churches and the National Trust and NTS, are beginning to look for ACR accreditation. The pressure on the profession to strengthen its system of accreditation emanated from Historic Scotland (the Scottish "national trust"). Historic Scotland has indicated its intention to require professional accreditation for work done under its auspices or with its financial support.

As a practical matter, it should be noted that there is considerable overlap between NVQ designations and the ACR designation. It is too early to say which designation will ultimately prevail or if the two will co-exist.

Architects:

In 1992 the Royal Institution of Chartered Surveyors (RICS) established a designation applicable to specialists in conservation work. This was followed in 1995 by a designation developed by the Royal Incorporation of Architects in Scotland (RIAS). In 1998 architects associated with the Conservation Group of the Royal Institute of British Architects (RIBA) established the Register of Architects Accredited in Building Conservation (AABC). The Register and the designation were operated outside of the ambit of RIBA until 2003 when the system was re-integrated with RIBA. The RICS and RIAS accreditations require presentation of a portfolio of 5 projects for peer review. The AABC accreditation criteria also include a portfolio requirement, but these are much more explicitly tied to the 1993 ICOMOS *Guidelines* referenced earlier. Applicants must indicate in their portfolios how the elements of their portfolio relate to each of the 14 ICOMOS criteria. The ICOMOS Guidelines are set out in Appendix C.

“It is acknowledged that amongst professionals there is a lack of understanding of traditional materials and how to use them, as most undergraduate training focuses on new build and modern technology, materials and methods of construction..”

Historic Buildings Council for Scotland, Annual Report, 1997-1998

It appears that RIBA may have been initially reluctant to establish a specialized designation for architects who work in the conservation of built heritage. Pressure to adopt such an accreditation clearly emanated from the “national trusts” and other heritage bodies. English Heritage (the English “national trust”) commented that “of 5,400 RIBA registered architects in the UK, between 800-1700 profess some interest, experience and competence in building conservation without a clear, transparent, and independently assessed means of demonstrating it.”¹⁴ In 2001 both English Heritage and Historic Scotland, the two largest “national trusts” imposed conditions on grant aided work, requiring that works of repair and conservation be under the direction of a registered architect accredited in building conservation. The only accredited conservation register for architects in England, Wales and Northern Ireland, recognised by the relevant historic building bodies, is the RIBA Register of Architects Accredited in Building Conservation (AABC). The two “national trusts” allowed a two-year period for the architectural profession to establish its conservation accreditation.

In 2002, the Royal Institute of Architects in Ireland (RIAI) commenced accrediting architects in conservation practice. There are three grades of accreditation:

- Conservation Practice/Architect – Grade I. This is the highest Grade. Practices and Architects accredited at this level are qualified to work on all Protected Structures.
- Conservation Practice/Architect – Grade II. Practices and Architects accredited at this level are qualified to work on all Protected Structures classified in the National Inventory of Architectural Heritage as being of ‘Regional’ or ‘Local’ importance.
- Practice/Architect Accredited to Work on Local Protected Structures. Practices and Architects accredited at this level are qualified to work on structures classified as of ‘Local’ importance in the National Inventory of Architectural Heritage.

¹⁴ Cited in J. Maxwell, “Architectural/Building Conservation,” November 10, 2003
http://www.ihbc.org.uk/Downloads/Education_papers/EG_1_Summary_10_November_1B.pdf

Accredited Conservation Architects and Practices should be able to provide advice in relation to:

- purchase of protected structures
- statutory obligations
- grants and funding
- historic research and analysis
- inventories, measured drawings and condition reports
- non-destructive investigation
- integration of modern technology and services
- design of appropriate alterations and extensions
- techniques of repair, restoration and consolidation
- liaison with fire officers, consultants and building owners in the formation of fire prevention and security strategies
- the need for services of specialist consultants, contractors, and craftsmen for the investigation, design and/or execution of works
- maintenance and management plans and schedules
- contracts suitable for conservation work.

There is no explicit referencing of the ICOMOS criteria in the Irish system of accreditation. It should be noted that, although the RIAI is based in Dublin, its mandate encompasses both the Republic and Northern Ireland. RIAI accredited architects may also practice in the UK. It is likely, therefore, that the RIAI designations will be recognized in the UK. *The RIAI also issued Guidelines for the Conservation of Buildings*, in 2001 to coincide with the initial launch of the Accreditation System.

Institute of Historic Building Conservation:

The Institute of Historic Building Conservation represents persons in all professions related to built heritage conservation. The membership of the Institute includes architects, town planners, building surveyors, estate managers, structural engineers, landscape architects, architectural historians, local authority conservation officers, officers from national conservation organisations, academics and private practitioners. The Institute claims a membership of approximately 1,360 persons. Full members are required to demonstrate competence in 8 areas:

- philosophy of conservation
- legislation and policy
- period technologies and materials
- history
- finance and economics relevant to the built heritage sector
- research, recording and analysis
- design and presentation
- general professional practice

Key Themes

Four themes emerge from this overview of occupational standards and skill supply in the United Kingdom and Ireland:

First, the “national trusts” played a decisive role in bringing stakeholders in the built heritage sector together to develop occupational standards. It was clearly the priority attached by the “national trusts” to a more systematic and focused approach to occupational standards that led to (a) the development of NVQs for technical conservation occupations, (b) the merger of the various professional conservator associations and the development of a common professional standard, i.e., the ACR accreditation, (c) recognition of a specialized heritage accreditation for architects by RIBA, and (d) the creation of the NHTG by the construction industry sector council.

Second, ICOMOS standards played an important role in the formulation of occupational standards for both NVQ regulated occupations and professional occupations.

Third, unlike the United States, the approach taken in the UK was a stakeholder approach that focused on developing accreditations that would be issued by the appropriate professional and occupational bodies. In this respect the UK approach is quite different from the US approach which focuses on occupational guidelines that apply to the employers or engagers of professionals in the conservation and restoration field.

Fourth, the UK approach is also broader than the US approach in that it also extends to technical occupations and the skilled trades.

7. Regulation of Built Heritage in Australia

Overview of Heritage Regulation

At the national level, Australia's system of heritage regulation was recently updated by adoption of the *Environmental and Heritage Amendment Act (1999)* and the *Australian Heritage Council Act (2003)*. The EHA establishes a National Heritage List and a Commonwealth Heritage List. The latter comprises heritage assets owned by the Commonwealth (i.e., federal) government. The former comprises heritage properties owned privately. Inclusion on these lists is administered by the Australian Heritage Council. The Act also provides for a nomination system. Inclusion on the Lists confers protection under the *Environmental Protection and Biodiversity Conservation Act*.

Heritage properties that are placed on the National Heritage List are described in terms of specific heritage values. The owners of these assets must protect these heritage values in any subsequent work done on the heritage properties. It is the heritage values that are protected, not the properties *per se*. Applying this distinction is the responsibility of the Department of the Environment and Heritage. If the Department determines that a proposed modification may have an adverse impact on heritage values, an assessment must be undertaken. Based on this assessment the Department will grant or withhold approval or grant a modified approval. The owners of properties included in the National Heritage List must also file a "management plan" that protects the heritage values of a listed property. This plan is also subject to approval. The purpose of this provision is to prevent 'running down' of heritage assets by neglect and thereby leaving little option but to approve demolition or radical modification. The merging of heritage protection and environmental protection is distinctly. In many respects, Australia has applied the environmental protection paradigm to heritage protection.

There are also separate state-level systems of heritage protection.

As of 2004, at the national level, Australia provides support through the tax system to private owners of heritage properties. However, similar to policy in the UK, owners of heritage properties do receive income tax deductions for donating their properties to the "national trust." An inter-governmental body, the Environmental Protection and Heritage Council recommended in 2004 a system of tax credits, accelerated depreciation allowances, and other measures to assist private owners of heritage properties.¹⁵ At the state level, some states provide for a re-evaluation of a heritage property based on actual use, rather than best market use. This results in a lower assessment for property tax purposes. A 20% tax rebate scheme operated at the Commonwealth level from 1994 to 1999, but was discontinued owing to lack of success and a general policy disinclination to use "tax expenditures" rather than direct expenditures. The Commonwealth government does operate a Cultural Heritage Projects Program which provides grants for approved restoration projects. Total grants under various Commonwealth programs were about A\$3.6 million in recurrent grants in 2001-02 and A\$75 million in non-recurrent grants. State-level grant programs provided approximately A\$11 million. Municipalities also administer modest grant and loan programs.

¹⁵ Environmental Protection and Heritage Council, *Making Heritage Happen*, Report of the National Incentives Task Force (April 2004) http://www.ephc.gov.au/pdf/EPHC/Summary_Making%20Heritage%20Happen.pdf The document contains a useful survey of policies in several other OECD countries as well as a synopsis of Australian policies.

Regulation of Professionals

Architects:

The Royal Architectural Institute of Australia (RAIA) functions as the professional body at the national level for practising architects. Certification is administered at the state level by “registration boards.” There is no specialist designation for “heritage architects” or “conservation architects.” Nor do official rosters of architects identify heritage practices. However, the term “heritage architect” is widely used in position descriptions and in public documents, including immigration qualifications.

Although the architectural profession has no specialist designation for “heritage architects,” in 2003, the RAIA adopted a Heritage Policy. This policy references the ICOMOS Burra Charter as a guiding document in heritage preservation.

Conservators:

The Australian Institute for the Conservation of Cultural Materials confers a professional accreditation. However a 2004 internal study revealed a low take-up rate for accreditation.¹⁶ The AICCM requires its members to adhere to a *Code of Ethics and Guidance of Conservation Practice*. The AICCM maintains a searchable roster of its members. There are approximately 200 listings on the roster.

The New South Wales state government publishes a roster of professionals in all relevant heritage occupations. The roster indicates that inclusion does not imply endorsement of qualifications. Criteria for inclusion in the NSW consultants roster are:

- Evidence of training in heritage leading to a clear understanding of the current approach to heritage conservation, including the Australia ICOMOS Burra Charter.
- Completion of at least one conservation management plan for a heritage site in line with James Kerr’s methodology in *The Conservation Plan, A Guide to the Preparation of Conservation Plans for Places of European Cultural Significance*.
- Heritage project experience.

There is also a statement that “preliminary work is underway in regard to an accreditation system for heritage professionals.” No further information could be obtained on these plans.

Regulation of Trades (New South Wales):

“The introduction of modern materials, such as concrete, and industrialized building systems, such as prefabricated or component-based assembly, has resulted in a radical shift in the building and construction industry... There is a crisis in the sector of the industry involved in the repair and maintenance of traditional buildings. Irreparable damage continues to be done to our irreplaceable heritage assets through the introductions of new materials and poor skills in conservation.” [Emphasis added.]

Heritage Trade Training Strategy, 2000-2005, Government of New South Wales

Regulation of trades is administered at the state level. However, there is a general effort to achieve national compatibility of competency standards. At the national level, 45 heritage competency standards have been developed. These competency standards will become part of the Building and Construction Training Package. Apprenticeships and trade designations in construction are tied to the competency standards set out in the Building and Construction Training Package.

¹⁶ Australian Institute for the Conservation of Cultural Materials, Professional Membership and Accreditation Review (2004) <http://www.aiccm.org.au/pdfs/accreditation.pdf>

In 1999, the Department of Education and Training of New South Wales, the largest state in Australia, undertook a systematic effort to train persons in heritage trades. Training was designed for both new entrants into the trades and for incumbent workers. The training strategy is largely based on the apprenticeship system. As such, it seeks to increase the number of heritage trade apprenticeships and also the amount of upgrade training in heritage skills to workers who already hold a trade designation. For example, contractors are required to include elements of the training package in their work plans for heritage restoration projects undertaken for the government of New South Wales or using funds provided by the government of New South Wales. The training project was overseen by a stakeholder committee. Continuation of the project may be taken over by the Construction Industry Training Board.

The training strategy addresses the following trades and skill areas:

New South Wales: Heritage Trade Skills

General Heritage Skills:

- prepare report for heritage restoration work
- prepare drawings
- prepare material and historical data
- prepare work plan

Roofing and Roof Plumbing

- repair/restore slate roofs
- restore heritage tiling
- restore metal roof cladding and capping
- restore heritage gutters and down pipes
- restore plumbing installations in heritage buildings
- restore cast iron and wrought iron work

Painting and Decorating

- paint and restore decorative plasterwork and timberwork
- restore heritage lining and stencilling
- restore decorative finishes
- restore gilding and bronzing
- restore heritage wall coverings

Plastering

- use modelling techniques to restore decorative plaster
- restore surfaces
- restore moulding
- restore plaster surfaces on dome and niches
- restore plaster columns and balustrades

Carpentry and Joinery

- repair/replace timber mouldings
- restore heritage timber roof structures

- restore sub-floor structures
- restore timber floors and lined walls
- construct and install arch centres
- restore timber fencing and gates
- restore curved timberwork
- restore splayed timberwork
- restore/replicate timber louvers and ventilators
- restore/replicate timber doors
- restore exterior feature timberwork
- restore timber wall and ceiling panelling
- restore heritage timber truss roof structures
- restore curved timber ceilings
- restore/replicate timber windows

Bricklaying

- restore brickwork
- restore heritage featured brickwork
- carry out underpinning
- repair/restore brick arches

Stonemasonry

- repair and preserve stone
- restore stonework with mortar
- restore stone wall construction
- restore tracery
- restore ornamental and feature stonework
- restore pressed metal ceilings
- restore heritage lining and scrolling

Key Themes

Three themes emerge from this review of heritage policy in Australia:

First, *in both policy and administration, heritage protection is integrated with environmental protection,*

Second, *specialized professional accreditation play only a limited role in Australia.* There is no specialized accreditation for architects and only limited impact of the system of voluntary accreditation for conservators. We uncovered no evidence that this is seen as a major issue by heritage bodies. We note, however, a widespread use of the term “heritage architect,” suggesting that there is an informal recognition of this specialization.

Third, there is a concerted effort in the largest Australian state, New South Wales, to address perceived shortages of heritage trade skills. *The strategy to address this shortage of heritage trade skills is integrated with the existing apprenticeship system and the existing system of national competency standards.*

8. Professional and Technical Occupations

Professionals in Heritage Policy and Administration:

Heritage Policy Administrators:

Heritage policy is primarily a governmental function, although heritage organizations in the non-profit sector are also involved in this area through their advocacy and advisory functions. All three levels of government are involved in the formulation and administration of heritage policy. Larger municipalities may employ specialized professionals in this area. Smaller municipalities are more likely to engage consultants or to assign heritage matters to their urban planning officials.

There are various levels of heritage policy administrators. At the senior level, individuals formulate policy recommendations, devise strategic plans for portfolios of heritage assets, and develop economic strategies involving heritage assets. At intermediate levels, individuals providing support to the policy process. Both senior and intermediate levels are also involved in administering heritage policies. Junior levels provide support to both functions.

Individuals working in the heritage policy field commonly have post-graduate training in a related discipline. However, participants in interviews and workshops indicated that most of the skills which are relevant to employment in the heritage policy field are learned through experience. Participation in international conferences is important in understanding developments in heritage strategy in other jurisdictions. There is no professional association for public servants who work in the heritage policy field. Many individuals in this field maintain memberships in professional associations that pertain to their ‘home discipline,’ e.g., architecture, conservation, history, etc.

Heritage Programme Administrators:

Programme administration is focused on delivery. As such, programme administrators are involved in budgeting, human resource deployment, site management, and cultural and historical content programming. Outreach and advocacy are also important aspects of heritage programme administration. In many instances, individuals have responsibilities in heritage policy as well as heritage programme administration. Along with governments, non-governmental bodies also play important roles in heritage programme administration.

Heritage programme administrators are typically trained at the post-graduate level in a related discipline. Similar to heritage policy administrators, most heritage programme administrators learned the preponderance of the skills related to their work through practical experience. There is no professional association for heritage programme administrators, though like heritage policy administrators, many individuals maintain memberships in their ‘home discipline.’

Heritage Planners, Site Managers and Administrators:

Heritage planning involves developing and administering conservation strategies for specific heritage sites and also developing and managing cultural and historical programming related to the site. In larger heritage sites, these functions may be divided. However, in many sites, the functions are combined. Individuals who carry out both functions are likely to be professionally qualified in one area and to learn through experience the skills required to function effectively in the other area.

Opportunities for professional development, though limited, are broader than for heritage policy and heritage programme administrators. Parks Canada and the Canadian Conservation Institute (CCI) both offer technical courses on conservation and restoration. The CCI also offers advanced courses in certain conservation-related fields. CCI's mandate, it should be noted applies to collections, as well as to built heritage structures. Training courses are also available through the Association for Preservation Technology International (APT). APT's 2005 annual conference will be held in Halifax.

Professional Heritage Consultants

Professional heritage consultants are engaged by governments, private owners, and private developers. Consultants work in a range of fields. Some assist governments in developing heritage strategies. Other consultants assist governments and private owners in assessing the heritage value of a particular property and devising a preservation or restoration strategy for that property. Heritage consultants come to the field from a variety of backgrounds. Most have post-graduate training in a related field such as conservation, archaeology, architecture, fine art or history. Some individuals also hold related academic appointments. Consultants whom we interviewed reported that most of the skills they apply were acquired through experience. While all individuals in the built heritage sector stressed the importance of experience, this theme was especially pronounced in our interviews with consultants.

Professional heritage consultants come from a range of specialized disciplines. They commonly belong to professional associations in their 'home discipline.' The Canadian Association of Professional Heritage Consultants (CAPHC) was established in 1987. CAPHC is distinctive in bringing together professionals from all of the disciplines that work in the built heritage sector. Membership at the professional level requires an undergraduate degree in a related discipline and 5 years of experience or a graduate degree and 3 years of experience. The related disciplines are: architecture, planning, archaeology or anthropology, social sciences (history, geography), museum studies, and archival studies. Membership at the professional level also requires 7 years of employment in the heritage field. CAPHC members are required to abide by a code of professional conduct. Although national in scope, CAPHC's members are drawn disproportionately from Ontario. CAPHC maintains a public registry of heritage consultants.

In addition, many practitioners from across the sector belong to the Association for Preservation Technology International, which was created in Canada in 1968. APT is a membership association that provides a multidisciplinary forum for education and dissemination of information about conservation to all parts of the built heritage sector. Many practitioners belong to both APT and CAPHC.

Heritage Architects/Heritage Landscape Architects

In Canada, architecture is a licensed profession. That is to say, only individuals who hold a license may describe themselves as architects and only licensed individuals may practice architecture as it is described in the licensing statute. Licensing is administered at the provincial level. In principal, an architect may meet the educational requirements through an extended apprenticeship that covers the syllabus of the Royal Architectural Institute of Canada (RAIC). Virtually all architects meet their educational requirements by obtaining a professional degree in architecture from a university accredited by the Canadian Architectural Certification Board (CACB). Under agreement with the provincial regulating bodies, foreign trained applicants have their educational qualifications reviewed by the CACB. After completing a recognized

degree programme in architecture, an individual must fulfill a supervised internship for a period prescribed by the provincial regulating body. This is generally in the range of 5,600 hours. Every provincial association requires interns to pass the US Architectural Registration Examination administered by the US National Council of Architectural Registration Boards. In some provinces, there are also additional requirements, such as an admission course or an oral examination. *None of these qualifying requirements explicitly addresses the unique issues associated with heritage structures. Nor do any of the professional architectural associations confer a specialist designation for heritage architects.*

Landscape architects are accredited rather than licensed. Accreditation is administered by the Canadian Society of Landscape Architects. University programs in landscape architecture are accredited by the Landscape Architecture Accreditation Council. In most provinces Landscape Architect is a “registered title” and the provincial association is recognized by a specific statute. Use of the title “Landscape Architect” is restricted to persons accredited by the provincial body. Following completion of a recognized undergraduate programme, individuals must meet provincial requirements for experience and professional development and pass a specified examination. *While heritage landscape architecture is a recognized area of specialization in some associations, no specific specialist designations are conferred.* Moreover, it should also be noted, that unlike the practice of architecture, membership in the professional association is not a requirement to work in the field. However, a non-member is not legally permitted to represent himself or herself as a “Landscape Architect.” The Alliance for Historic Landscape Preservation is a membership-based association of landscape architects specializing in conservation work. The Alliance has members in both the US and Canada.

Professional Conservators

CAPC estimates that there are approximately 400 professional conservators in Canada. The conservator profession combines two types of persons. Some individuals were trained at the university level, often at the graduate level. Other individuals learned their skills through a formal or informal apprenticeship. The latter is more common in Europe. Conservators tend to specialize in types of conservation and restoration work, e.g., paintings, wooden objects, metals, stone, textiles and fabrics, paper, etc. Whether in private practice or employed, conservators must have access to a laboratory or studio.

Professional accreditation is voluntary. The Canadian Association of Professional Art Conservators was established in 1971. The organization subsequently changed its name to the Canadian Association of Professional Conservators (CAPC). CAPC administers a voluntary professional accreditation. Accreditation is based on an assessment of training, experience and laboratory or studio facilities. Professional members of CAPC are accredited in particular types of conservation or in particular types of conservation activity. A 1996 article estimated that CAPC represents approximately 25% of practicing professional conservators in Canada.¹⁷

Parallel to CAPC is the International Institute for Conservation – Canadian Group (IIC-CG). Unlike CAPC, ICC-CG is open to any individual or organization interested in conservation.

¹⁷ CAPC, “Accreditation in Conservation: The Canadian Experience,” published in ICOM Committee for Conservation 11th Triennial Meeting, Edinburgh, Scotland, 1-6 September 1996, Preprints, Volume 1, James & James, London, page 153-157. Available at: <http://www.capc-acrp.ca/FramesPage.htm>

Other Heritage Professionals

Other professionals preponderantly involved in the built heritage sector include architectural historians, building historians, historical geographers, and historians among others. Individuals in these professions usually have post-graduate training. Many belong to professional associations in their 'home discipline.' Professionals in the private sector may belong to the CAPHC.

Professionals without Specialized Heritage Skills

The mapping of occupations that are involved in the built heritage sector identifies a number of professions whose work impinges on the sector [See Appendix D]. These include urban planners, engineers, cost consultants/quantity surveyors, and interior designers, among others. The Heritage Canada Foundation Report, *Human Resource Issues in the Preservation of Heritage Buildings* drew particular attention to the role of urban planners. This theme was echoed in some of the workshops and interviews. The importance of engineers who understand the distinct features of the built heritage sector was also stressed in a some of the workshops and interviews.

Human Resource Issues

Professional Recognition:

Professional recognition was raised as a concern among professionals working in the public and non-profit sector and also in the private sector. Professionals working in heritage policy and heritage programme administration and administering heritage sites identify professional recognition with professional development and with forums for interacting with other professionals in their field. In the private sector, professional recognition is identified with a greater recognition on the part of other professionals of the distinct skills which built heritage professionals bring to projects in the built heritage sector.

Organizational Gap:

As described earlier most professionals in the built sector have a "home discipline." They usually maintain membership in the professional association related to that discipline. It is also common for professionals to belong to multi-disciplinary bodies, such as the Association for Preservation Technology or the Canadian Association of Professional Heritage Consultants. *A significant gap in the sector's organizational fabric is "home" for professionals who are employed in the public sector and by heritage institutions in the non-profit sector.* As noted, we estimate these professionals to number approximately 2,500 to 3,000 persons. Among their common interests are the need for professional training, the need to keep abreast of developments the policy and programme field, and the need to have an organized interaction with professionals in other fields. More interaction with urban planners is particularly important, in light of the role played by urban planners in framing and administering policy at the local level.

Recommendation No. 1

Supporting the Professional Work Force

That an organization be established to support the professional work force in the built heritage sector.

Background: Supporting the professional work force in the built heritage sector is one of the keys to strengthening the sector. Professionals in the built heritage sector have a number of needs that require distinct organizational expression. These include professional development, advocacy on behalf of the sector, policy advice to governments, succession planning, the maintenance of professional standards, co-ordination across the sector, collective representation, and managing relations with other professions whose work has an impact on the sector. Discipline-based organizations play an important role, but are able to speak to only some of these needs. In particular, there is no acknowledged organizational home for professionals employed by the public and non-profit sector. The sector needs an umbrella professional organization that would respect the role of existing organizations, but address the gaps in the organizational fabric of the built heritage sector.

Succession Planning / Portals of Entry:

Succession planning was identified as a potential problem by participants in a number of workshops and interviews. The focus of these remarks was principally on positions in heritage policy and heritage programme administration. To confirm this problem and to gauge its seriousness requires a demographic survey of incumbents. Such a survey ought to be undertaken to profile the professional heritage workforce employed by the major governments and heritage organizations. Should such a survey indicate a likely succession problem, steps may be required to create new portals of entry, such as entry level positions or internships. There may be value in exploring a “co-op” or internship option with the universities and colleges that have built heritage programmes.

Urban Planners:

Participants in interviews and workshops commented on the important role played by urban planners in advising municipalities on the economic development role of heritage structures. This was also a theme of the Heritage Canada Foundation Report, *Human Resource Issues in the Preservation of Heritage Buildings*. Some participants in interviews and workshops felt that, while attitudes had evolved, the economic potential of the built heritage sector is not fully understood. On the other hand, we also interviewed an urban planner with strong credentials in the built heritage sector. The urban planning profession and the legislative environment at the municipal level are far too diverse to support broad generalizations. The evidence from our interviews and workshops indicates that the dialogue between the built heritage sector and urban planning is more developed today than it was a few decades ago. In some municipalities, heritage planning is central to overall urban planning. The City Montreal, for example, has provided considerable support to the built heritage sector through Heritage Montreal.¹⁸

Although the sensitivity of many urban planners to the built heritage sector has increased, support for mandated training would be limited. A more fruitful avenue would be to explore ways of structuring and furthering the dialogue between urban planners and the built heritage sector. A formal committee might assist in structuring this dialogue. Among others, the committee could include the Canadian Institute of Planners and its provincial counterparts, the Canadian Association of Professional Heritage Consultants and the Heritage Canada Foundation. An initial focus for such a dialogue might be on jointly compiling and publishing (or republishing) the numerous case studies that illustrate the role of the built heritage sector in urban development and urban regeneration.

¹⁸ See Heritage Montreal: http://www.heritagemontreal.qc.ca/hm_en/ind_en.htm

Professional Development:

Professional development needs differ considerably across the professions involved in the built heritage sector and also by the stage of an individual's career in the sector. For individuals in the policy and programme administration field, professional development chiefly takes the form of attending conferences and, in some cases, participating in specialized training in UNESCO-related bodies. In light of the limited number of persons that are involved in heritage policy, it is not surprising that there are few opportunities in Canada for professional development training. The requirements of professionals involved in site management, heritage architecture and conservation include a specific focus on technical issues and, in particular, being kept abreast of developments in conservation technologies. All professionals benefit from exposure to developments in conservation strategy and conservation philosophy.

Our interviews and workshops indicated that there may be a significant unmet demand for professional development training. It was particularly notable that technical courses offered by Parks Canada are “sell outs.” It was not clear from the interviews and workshops whether the professional development deficit reflects the limited availability of such training in Canada or whether the resources that public and non-profit employers are able to invest in professional development are simply too limited. Limited budgets for professional development is undoubtedly a factor, but they may not be the whole explanation. Relative to many other fields, the institutional capacity to provide professional development training in Canada is fragmented and under-developed.

Professional Occupational Standards:

In the discussion of heritage systems in other jurisdictions, an important contrast emerged between the United States and the United Kingdom. In the US, the Department of the Interior, through the National Parks Service, has established occupational guidelines which are mandatory for bodies accessing federal funds or federal tax credits. The guidelines apply to the employers or engagers of professionals and must therefore be reflected in tender specifications or job descriptions. This system operates outside of any system of professional accreditation and, in many respects, operates *in lieu* of such a system. In the UK, by contrast, the “national trusts” encouraged various professional associations to adopt accreditation systems that could subsequently be linked to funding conditions. In the UK the movement towards accreditation extends to technical occupations and skilled trades, through the NVQ system. Engineers, however, have not been a focus of concern in the UK. In the US, the occupational guidelines are limited to professional occupations and include engineers.

Before considering whether Canada should consider either of these approaches, we must ask what the problems are and how they manifest themselves. The interviews and workshops identified three possible problems: architects, engineers and project managers. Many architects and engineers, it should be noted, also undertake project management functions. The central issue raised was broadly the same: in the absence of specific training or experience in the built heritage sector, architects, engineers and project managers can make serious errors that ultimately cause irretrievable damage to a heritage structure. *The essential problem is a failure to recognize the built heritage sector as significantly different from new construction and ordinary renovation or repair.*

- Architects who lack experience in the built heritage sector may impose designs that are incompatible with the architectural or historical values of a heritage structure. Consequently, original features or components of the heritage structure may be unnecessarily replaced, lost or submerged through insensitive renovations and additions.
- Structural or civil engineers without experience in the built heritage sector may not understand the engineering properties of traditional building materials or methods. This may lead to design specifications that are inappropriate. Mechanical engineers may not understand the way in which heritage structures can be more vulnerable to humidity, condensation or vibration. In retrofitted projects, mechanical systems may be designed and installed in a way that unnecessarily detracts from the heritage character of a building.
- Project managers who lack experience in the built heritage sector may underestimate time requirements, fail to recognize the need for conservation specialists, and use trade contractors and other professionals who similarly lack the skills that are distinctly required by the built heritage sector. Heritage features of a building may be unnecessarily replaced.

As noted in Chapters 5 and 6, the experience of the US and the UK lends significant credence to the concerns raised. However, *based on the consultations that inform this study, we cannot conclude with certainty that the concerns raised in our interviews and workshops constitute systemic problems.* To draw such a conclusion would require a more systematic canvassing of the owners of heritage properties in both the public and private sector. Professional bodies for engineers, architects and project planners also should be involved in any such research.

Engineers:

In the case of engineers, the interviews and workshops do not make a strong case for a specialist “heritage engineer” designation. While there are distinctive engineering issues in the built heritage sector, these may be factors that can be dealt with by continuing professional development and advice to the owners of heritage properties to engage appropriately experienced or trained engineers. It should be noted that most professional engineering associations in Canada have adopted (or are adopting) policies which make continuing professional development a condition of licensure.

In the engineering profession, there is an exceptionally well developed institutional capacity to deliver continuing professional development. The various engineering discipline associations are active in the field of professional development, as are the free-standing professional development centres. The largest of these professional development centres is the University of Toronto’s Centre for Professional Development, which is affiliated with its Faculty of Engineering. It may be appropriate to explore with the major deliverers of professional development training the possibility of specialized courses in the application of engineering to built heritage structures.

Architects:

In the case of architects, the interviews and workshops suggest a stronger justification for exploring a specialized “heritage architect” designation. Architects play a pivotal role in the built heritage sector. Most commonly, it is architects that are responsible for the initial conceptualization and design of a project, including the specification of which features will be preserved. Architects may specify the use of particular materials or techniques. In many cases, architects also function as project managers. In this capacity they either select or

advise on the selection of general contractors and trade contractors. As both designers and project managers, architects working in the built heritage sector must know when to draw on the expertise of professional conservators. The need for architects who are specialized in the built heritage sector is already partially recognized in the labour market by the emergence of architectural firms with specialized practices. It was noted in Chapter 5 that the US has occupational standards for architects who work in the built heritage sector. In the UK, Chapter 6 described the movement to introduce a specialist designation through the Royal Institute of British Architects. The Royal Institute of Architects in Ireland adopted specialist designations in 2002.

It was noted earlier that there are two distinct approaches to occupational standards. In the US, professional standards were established by the Secretary of the Interior and made applicable to all work undertaken using federal monies, including federal tax credits. This system of professional occupational standards applies to the employers or engagers of professionals. The standards therefore operate outside the system of professional accreditation. In the UK, the favoured approach is specialist credentials administered by professional bodies. Occupational guidelines are easier to establish and apply than accreditation schemes. However, the impact of occupational guidelines is confined to work carried out under the auspices of the body sponsoring the guidelines. A broader scope is potentially achievable through the specialized accreditation route.

Recommendation No. 2

Architecture and Engineering Professions in the Built Heritage Sector

That a research project focused on the role of architecture and engineering in the built heritage sector be carried out to document the distinct professional skill requirements of persons in the architectural and engineering professions who work in the built heritage sector and the extent to which professional specialization already prevails; and to examine the possible role of professional standards, continuing professional development, specialized registries, or other procedures in meeting the needs of the built heritage sector for professionals in these fields.

Background: This research project should be developed in co-operation with the respective professional associations and with major public and private owners of heritage structures. The project would need to take account of regional differences.

Technical Occupations

Technicians and technologists are usually trained in community and technical colleges or CGEPS.

There are two types of technical occupations that are relevant to the built heritage sector. The first are technical occupations that usually work under the direction of a related professional. Among others, these include architectural and engineering technologists. Some conservators also employ technicians. The second type of technical occupation are those which often work independently of a related professional. These may include materials testers, photogrammatrists, building recorders, etc.

It is noteworthy that our interviews and workshops identified no serious concerns about either shortages or the quality of skills in regard to technical occupations. On the whole, therefore, the impression is that a sufficient number of young persons are drawn into these occupations and that the college system does a commendable job in providing them with appropriate training.

9. Skilled Trades, Crafts, and Trade Contractors

The Construction Industry and the Built Heritage Sector

The dialogue between the construction industry and the built heritage sector is not well developed in Canada, in comparison with other jurisdictions that we examined. In the UK, the National Heritage Training Group (NHTG) was established to develop occupational standards that take account of the particular needs of the built heritage sector. In Australia, the Department of Education and Training of New South Wales has established a stakeholder advisory committee to assist the Department in implementing a systematic program to train persons in the skills needed to work in the built heritage sector. In the United States, a more modest undertaking involves the Preservation Trades Network which emerged from the Association for Preservation Technology.

Our interviews and workshops identified a number of concerns. Trades in which there are said to be shortages of persons with trade skills and built heritage experience included: finish carpenters, cabinet makers, sheet metal workers (copper and lead), stone masons, plasterers, and iron workers. Other persons whom we interviewed focused not on specific trades, but on the attitudes that are required of persons working on a built heritage site, regardless of their specific trade. Skill shortages were also said to be a problem in certain crafts, such as leaded and stained glass workers and wood and stone carvers. These crafts are typically outside the purview of the contract construction industry. The interviews and workshops also raised concerns about contractors without experience in the built heritage sector winning assignments and carrying out a job as if it were an ordinary construction job. Overall, our interviews and workshops revealed only limited understanding of the contract construction industry and skilled trades training system on the part of many stakeholders in the built heritage sector. And conversely, there is only limited understanding of the specific needs of the built heritage sector on the part of many segments of the construction industry. This distance must be bridged before specific initiatives are undertaken.

Trade Contractors

In building construction, approximately three-quarters of construction workers are employed by trade contractors, rather than general contractors or homebuilders. In some markets, the volume of work is sufficient to support trade contractors who specialize in the built heritage sector. These contractors employ a core work force of experienced tradespersons who can supervise and monitor the work of others, as well as develop the skills of new hires. In most trades, however, restoration contracting is an exceedingly small part of the market. The masonry trade is the only trade in which restoration contracting constitutes a significant portion of the market, although it should be noted that much of this restoration work involves post-war construction.

Fluctuations in the construction industry make it impractical to confine work to specialized contractors. A number of persons interviewed commented that fluctuations in the amount of work in the built heritage sector broadly follows the construction cycle. When the industry as a whole is busy, so also are specialized heritage contractors. Conversely, when conditions are slow for the industry, they also tend to be slow for specialized heritage contractors. This has two implications. First, when the capital spending cycle is approaching its peak the demand for heritage construction services is likely to exceed the capacity of the specialized contractors. The owners of heritage properties may be disinclined to wait for specialized contractors to become available. In some circumstances, delay may increase the risks to the integrity of a structure. In other situations, delay

may jeopardize funding. It is almost inevitable, therefore, that there will be circumstances in which the pool of well established, specialist contractors is fully utilized and there will be a need to draw on other resources. A quite different set of conditions prevails when the capital spending cycle is approaching its trough. In these conditions, both specialized and non-specialized trade contractors will be eager to secure work. Bidding for work can be aggressive. In some cases, non-specialized contractors will under-bid well established, specialized contractors. In most circumstances, low bids are successful.

The involvement of inexperienced trade contractors in the built heritage sector causes three concerns. The first is that these contractors may damage or unnecessarily replace heritage features of a structure. The second concern is that inexperienced trade contractors may do a poor job, owing to their lack of understanding of traditional building materials and building methods. And lastly, inexperienced trade contractors who have no commitment to the built heritage sector do not invest in developing work force skills that the sector needs.

A possible approach to this problem, where it is permitted, would be to maintain pre-qualification criteria. In some circumstances, it may be possible to maintain pre-qualification rosters, though this procedure is generally not feasible in the public sector. Pre-qualification is a standard procedure in the mainstream construction industry. The Canadian Construction Association, for example, publishes "Form CCDC-11" which it recommends for administering pre-qualification screening.

Before embarking on a pre-qualification procedure, significantly more needs to be known about the number of specialized built heritage contractors, the regional markets in which they work, the trades they cover, and the proportion of work for which they are responsible. In some circumstances, barriers to the inter-provincial mobility of contractors may be an unnecessary compounding factor in skill shortages.

Skilled Trades

Most of the skilled trades in the construction industry undertake work in the built heritage sector. This is especially the case where a heritage structure is being adapted for modern use or where an aesthetically compatible addition is being constructed. In retrofits, the trades and the trade contractor need to understand the preservation goals of the project, so as to be able to undertake the retrofit work in a manner that is compatible with the preservation goals. Those goals will differ from project to project. In many projects, the owner-developer is chiefly concerned with preservation of the exterior façade. In other projects, the preservation objective extends to common spaces, while in still other projects, preservation of every component or feature of the structure is the goal.

We have no reliable estimates of what proportion of the skilled trade work force are regularly employed in the built heritage sector. Individuals whom we interviewed in Quebec, estimated the proportion at 3-4%. In the UK, the National Heritage Training Group (NHTG) estimated that approximately 4% of the construction work force in the UK is experienced in traditional building techniques.

Definitions of built heritage for the purpose of heritage preservation policy and definitions for the purpose of estimating skill needs may differ. Preservation policy is based on historical, cultural and aesthetic criteria. By these criteria, as noted earlier, an increasing number of post-1945 structures are likely to enter the heritage stock. For purposes of gauging skill needs, however, there are two key criteria. The first is whether building methods and building materials differ from those for which tradespersons are currently trained. The second

is the nature of the preservation goals. The relationship between preservation goals and the availability of skills is not necessarily straight forward. In the private sector, preservation goals can be influenced by the availability of skills. In other words, if architects or owners generally believe that high quality traditional skills cannot be hired, they may alter their preservation goals to take account of this perceived shortage of skills.

A viable training strategy for skilled trades in the built heritage sector must rest on a solid analytical foundation of needs. The parameters of this analysis would include:

Demand Analysis	estimates of trends in the amount of construction and repair work undertaken in the built heritage sector
Analysis of the Composition of Demand	estimates of the distribution of work in the built heritage sector across trade
Supply Analysis	estimates of the number of tradespersons who regularly work for specialized built heritage sector contractors and who have acquired the requisite skills through experience
Gap Analysis	a range estimate of the skills gap and how it is likely to evolve, in light of demographic factors
Skill Analysis	focused profiles of the specific built heritage skills needed for each trade. Skill requirements should be developed using a DACUM analysis and expressed in terms of specific competencies
Training Capacity Analysis	inventory of training currently available

Based on such an analysis, recommendations can be made on (1) developing specialized trades (2) integrating built heritage skills into general training for a trade, or (3) developing a training unit which leads to specialized endorsement for a certificate of qualification. There may also be a need to accommodate regional needs within the context of nationally recognized standards.

The following table compares trades addressed by the NHTG in the UK, the Heritage Trade Skills covered by the New South Wales training programme, and the trades in which skill shortage issues were noted by more than one of the participants in our interviews and workshops. While this comparison does not provide guidance on the type of training or the numbers of persons needed, it is helpful in identifying initial priorities.

UNITED KINGDOM (NHTG)	NEW SOUTH WALES AUSTRALIA	CANADA: TRADES IDENTIFIED IN INTERVIEWS & WORKSHOPS
Stone Masonry	Stonemasonry	Stone Masons
Carpentry and Joinery	Carpentry and Joinery	Finish/Trim Carpenters
Roof Slating and Tiling	Roofing and Roof Plumbing	Roofers/Sheet Metal Workers
Bricklaying	Bricklaying	Bricklayers
Painting and Decorating	Painting and Decorating	Decorative Painters
Plastering	Plastering	Plasterers
Leadworking		
Steeplejacking		Ironworkers (decorative)
Thatching		Plumbers
Craft Masonry		Electricians

It is noteworthy that electrical and mechanical trades are not referenced in either the UK or the Australian initiatives. Our occupational profiles in Appendix E indicate, however, that there are distinctive features of working in the built heritage sector that are sometimes pertinent to these trades, especially to the plumbing trade. This point was also emphasized by a number of the individuals whom we interviewed.

In the masonry trade, efforts are already well advanced to develop occupational standards and related training for restoration masonry. Similar discussions have occurred with respect to the carpentry trade. However, these discussions have not crystallized around a consensus solution. In part, this reflects the absence of analytical information on the amount of work, the current supply of experience-based skills, and the specific nature of the skills required. In the interior systems market, drywall predominates making plastering a niche skill. Again, there is a lack of analytical information on the amount of plastering work and whether current trade standards for plastering meet the needs of the built heritage sector.

Crafts

Certain skills required in the built heritage sector are better described as crafts, since these skills are outside the formal system for training and qualifying skilled tradespersons. The craft skills which were most frequently mentioned in our interviews and workshops were: stained and leaded glass workers, stone carvers and wood carvers. Information on these crafts is anecdotal. While many colleges offer training in these crafts, there is no information on the number of persons who work full-time in these crafts. Nor do we have information on the calibre of craft skills available to the built heritage sector.

Strengthening Dialogue between the Construction Industry and the Built Heritage Sector

We noted at the beginning of this chapter that, in Canada, the dialogue between the construction industry and the built heritage sector is less developed than in some other jurisdictions. The approach taken in the UK may be particularly relevant. In the UK, CITB-Construction Skills is the sector council responsible for occupational skills in the construction industry. In 2004, CITB-Construction Skills established a subordinate organization, the National Heritage Training Group, to address the skill needs of the built heritage sector. This initiative was taken in collaboration with English Heritage, one of the four “national trusts” responsible for maintaining listed sites. A similar approach may be appropriate in Canada.

Recommendation No. 3

The Built Heritage Sector and the Construction Industry

That the Cultural Human Resources Council work with the Construction Sector Council, to provide an analysis of the supply and demand characteristics of skilled trades in the built heritage sector, as part of the CSC's ongoing Labour Market Information project..

Background: Stakeholders in the built heritage sector have a keen interest in ensuring that the distinct trade skills needed by the sector are systematically analyzed and addressed. In the UK, this function is undertaken by the National Heritage Trades Group of the Construction Industry Training Board. In New South Wales, Australia, the state government has carried out this function. In Canada, there is a gap. In most trade standards, there is little, if any recognition of the distinct skills needed by the built heritage sector. The Construction Sector Council is best equipped to fill this gap. The Cultural Human Resources Council should assist the Construction Sector Council in drawing on the insight and contribution of stakeholders in the built heritage sector.

10. Measuring Employment and Economic Activity in the Built Heritage Sector

To make any significant progress in strengthening human resource planning in the built heritage sector, it is essential that better estimates be developed of the number of persons who work in the sector, their occupational distribution and their demographic characteristics. Equally, it is important to have better estimates than we now have on the amount of preservation, repair and construction spending in the sector, as well as estimates of the distribution of that work across the trades. It would also be helpful to better estimates of the pool of heritage (or older) structures so that the impact of demolition could be better understood. The absence of descriptive employment and economic data was a one of the themes of the Heritage Canada Foundation's report, *Human Resource Issues in the Preservation of Heritage Buildings*.

There are several technical difficulties in measuring the built heritage sector:

1. There is no consensus on how to define the sector, viz., on what constitutes a heritage structure.
2. The North American Industrial Classification Systems (NAICS), which is used to analyze data at the industry level, does not lend itself to analysis of the built heritage sector.¹⁹
3. The National Occupation Classification (NOC) system identifies occupations at a level of aggregation that subsumes occupations that are specific to the built heritage sector into broader occupational categories.²⁰ For the most part, there are too few incumbents in specialized occupations in the built heritage sector to warrant distinct NOC classifications. Were such classifications to be devised, data suppression rules would effectively prevent the release of statistical information.
4. There is no central registry of designated heritage structures. Nor do the registries that exist track capital and repair expenditures. (Statistics Canada does, however, publish data on capital and repair expenditures for heritage institutions and nature parks.)
5. Building permit data do not identify planned construction spending in relation to the age of a structure. In any event, building permit data are notoriously unreliable for renovation spending in the residential sector. In 2003, Statistics Canada's Homeowner and Renovation Repair Survey has been folded into the Survey of Household Spending. The age of structures is not identified in either survey, nor do the data provide any detail on the nature of the renovation or repair.

Although the technical difficulties are significant, they do not require us to throw up our hands. While we cannot develop precise measures of employment and economic activity, we can develop better data than the "back-of-the-envelope" estimates on which we are now obliged to rely.

1. Public and Non-Profit Sector Employment

A "census" could be undertaken of persons working in the built heritage sector for federal, provincial and territorial governments, as well as major municipalities and heritage organizations. This "census" could identify occupation, education, accreditations, gender and age category, along with other variables judged important to human resource planning.

¹⁹ The NAICS system distinguishes between "prime contracting" and "trade contracting." Prime contracting is further separated into residential, non-residential and engineering construction. Trade contracting is subdivided by trade. The age of a structure is not material to the NAICS system

²⁰ The occupational profiles in Appendix A indicate the relevant NOC classifications for the occupation

2. Private Sector Professional Employment

The number of professionals in the private sector who work full-time or substantially full-time in the built heritage sector could be estimated through a process of consultation with practitioners and professional associations. Among the organizations that could assist are:

- the Canadian Association of Professional Heritage Consultants (CAPHC)
- the Canadian Association of Professional Conservators (CAPC)
- the Association for Preservation Technology International (APT) – Canadian members
- the International Institute for Conservation - Canadian Group (IIC-CG)

It should be possible to compile a working list of architectural firms, based on the knowledge of firms with a recognized presence in the sector.

3. General Contractors and Trade Contractors:

Using the working list of architectural firms that have a recognized presence in the built heritage sector, it may be feasible to compile working lists of general contractors and trade contractors who commonly undertake work in the sector. These general contractors and trade contractors could be canvassed for information on employment, skill shortages, etc.

4. Better Estimates of Capital and Repair Spending

Reed Construction Data, through its Canadian subsidiary CanaData, maintains a proprietary database of construction projects.²¹ The database provides information on projects in the Industrial Commercial and Institutional (ICI) sector and the high-rise residential sector. Reported information includes project value, square footage (if applicable), time frames for key stages in the project, owner-developer, general contractor, and consulting engineers and architects. Information on trade contractors is reported though it is highly uneven. The database is fairly comprehensive for construction work that requires a building permit. Repair contracts are not covered. In many jurisdictions, electrical work is regulated by a different permit system. Coverage of electrical work may not be as comprehensive as other types of trade contracting.

Many architectural and engineering firms and trade contractors are regular users of this database. The database obtains its information from building permits and from a network of consulting architects and engineers. The CanaData database does not currently allow for easy identification of built heritage structures. However, it may be practical for CanaData to establish such an identifier if there were major users who required this data and whose subscription revenues would justify CanaData in collecting this additional information. If practical, this would be the most cost-efficient way of collecting systematic data on the volume of construction activity in the built heritage sector.

²¹ <http://www.reedconstructiondata.ca/community/815/>

5. Estimates of Employment Co-Efficients and Share of Work by Trade

The usual procedure for gauging the number of persons employed in particular types of construction work is to formulate an estimate of the amount of employment that correlates to \$1.0 million of spending on that type of construction. This is known as the employment co-efficient of construction spending. These co-efficients are developed using a sample of projects for which information is available. The co-efficients are then applied to the global estimates of spending on the particular type of construction. For new construction, analysis along these lines has been undertaken by the Ontario Construction Secretariat, among others.

In the built heritage sector, estimating employment co-efficients would require analyzing information on major projects. This information would have to be provided by major public sector sponsors of these projects and by architectural or other firms that operated as project managers. This analysis would also allow a further set of estimates to be prepared estimating the approximate share of work by trade. This information is important in identifying priorities for the development of specific heritage sector skills.

6. Better Estimates of the Stock of Heritage Structures

The heritage value of a structure is a function of its age and its aesthetic, cultural or historical significance. Moreover, as described earlier, attitudes towards heritage value evolve. Many vernacular structures previously not thought of as having significant heritage value are now understood to be important reflections of our past. In light of these complexities, there is no straight forward way to estimate the size of the heritage stock. However, it may be practical to use property assessment data to at least gauge the age and diversity of constructed assets. While this procedure would provide only a proximate indicate of the heritage stock, it would nevertheless be a useful contribution. In some jurisdictions, property assessment is a governmental function. In others, property assessment has been transferred to the private sector. While CMHC has data on the age of the residential stock, there is no similar inventory of non-residential properties. The scope for using property assessment data should be explored.

Recommendation No. 4

Rectifying Data Deficiencies

That the Built Heritage sector's data needs be identified and prioritized, and strategies taken to rectify the most serious data deficiencies.

Background: These strategies could include customized surveys, systematic consultations, co-operation with privately managed construction industry databases, and econometric modelling.

11. Recommendations

Recommendation No. 1 Supporting the Professional Work Force

That an organization be established to support the professional work force in the built heritage sector.

Background: Supporting the professional work force in the built heritage sector is one of the keys to strengthening the sector. Professionals in the built heritage sector have a number of needs that require distinct organizational expression. These include professional development, advocacy on behalf of the sector, policy advice to governments, succession planning, the maintenance of professional standards, co-ordination across the sector, collective representation, and managing relations with other professions whose work has an impact on the sector. Discipline-based organizations play an important role, but are able to speak to only some of these needs. In particular, there is no acknowledged organizational home for professionals employed by the public and non-profit sector. The sector needs an umbrella professional organization that would respect the role of existing organizations, but address the gaps in the organizational fabric of the built heritage sector.

Recommendation No. 2 Architecture and Engineering Professions in the Built Heritage Sector

That a research project focused on the role of architecture and engineering in the built heritage sector be carried out to document the distinct professional skill requirements of persons in the architectural and engineering professions who work in the built heritage sector and the extent to which professional specialization already prevails; and to examine the possible role of professional standards, continuing professional development, specialized registries, or other procedures in meeting the needs of the built heritage sector for professionals in these fields.

Background: This research project should be developed in co-operation with the respective professional associations and with major public and private owners of heritage structures. The project would need to take account of regional differences.

Recommendation No. 3 The Built Heritage Sector and the Construction Industry

That the Cultural Human Resources Council work with the Construction Sector Council, to provide an analysis of the supply and demand characteristics of skilled trades in the built heritage sector, as part of the CSC's ongoing Labour Market Information project.

Background: Stakeholders in the built heritage sector have a keen interest in ensuring that the distinct trade skills needed by the sector are systematically analyzed and addressed. In the UK, this function is undertaken by the National Heritage Trades Group of the Construction Industry Training Board. In New South Wales, Australia, the state government has carried out this function. In Canada, there is a gap. In most trade standards, there is little, if any recognition of the distinct skills needed by the built heritage sector. The Construction Sector Council is best equipped to fill this gap. The Cultural Human Resources Council should assist the Construction Sector Council in drawing on the insight and contribution of stakeholders in the built heritage sector.

Recommendation No. 4 **Rectifying Data Deficiencies**

That the Built Heritage sector's data needs be identified and prioritized, and strategies taken to rectify the most serious data deficiencies.

Background: These strategies could include customized surveys, systematic consultations, co-operation with privately managed construction industry databases, and econometric modelling.

Recommendation No. 5 **Maintaining Momentum**

That the Cultural Human Resources Council continue to provide a forum for the sector through its Built Heritage Committee and continue to work on the challenges of developing a comprehensive human resource strategy for the built heritage sector.

Background: The Cultural Human Resources Council has made an important contribution to the built heritage sector by bringing together a broad representation of stakeholders in the sector. By doing so the Cultural Human Resources Sector has both reflected and strengthened the sector's understanding of its distinct technical and professional human resources. The Cultural Human Resources Council should continue to provide a forum for the sector through its Built Heritage Committee.

Appendix A

Steering Committee Members

Marie Lalonde, CHAIR

EXECUTIVE DIRECTOR
ONTARIO MUSEUMS ASSOCIATION

Brian Arnott

PRESIDENT
CANADIAN ASSOCIATION OF PROFESSIONAL HERITAGE
CONSULTANTS

Robert Blakely

DIRECTOR OF CANADIAN AFFAIRS
BUILDING AND CONSTRUCTION TRADES DEPARTMENT

Joe Bognar

DIRECTOR CANADIAN AFFAIRS
INTERNATIONAL UNION OF BRICKLAYERS & ALLIED
CRAFTWORKERS
OTTAWA, ONTARIO

Alice Born

ASSISTANT DIRECTOR – STANDARDS DIVISION
STATISTICS CANADA

Mark Brandt

MARK T. BRANDT, ARCHITECT
OTTAWA, ONTARIO

Natalie Bull

MANAGER, HERITAGE CONSERVATION SERVICES
DIRECTORATE
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

Joy Davis

PROGRAM DIRECTOR, CULTURAL RESOURCE
MANAGEMENT PROGRAM
DIVISION OF CONTINUING STUDIES
UNIVERSITY OF VICTORIA

Douglas Franklin

DIRECTOR, POLICY AND PROGRAMS
HERITAGE CANADA

Peter Frood

DIRECTOR, HISTORIC PLACES PROGRAM
PARKS CANADA

Paul Gravelle

NATIONAL COORDINATOR, EDUCATION AND TRAINING
CANADIAN HOME BUILDERS ASSOCIATION

Jon Hobbs

EXECUTIVE DIRECTOR
ROYAL ARCHITECTURAL INSTITUTE OF CANADA

Trish Horricks

STATISTICS CANADA

Marie Lalonde

EXECUTIVE DIRECTOR
ONTARIO MUSEUM ASSOCIATION
CHRC BOARD OF DIRECTORS

Tania Martin

PROFESSOR, ARCHITECTURE
UNIVERSITÉ DE LAVAL

Susan Murdock

HERITAGE POLICY DEVELOPMENT
DEPARTMENT OF CANADIAN HERITAGE

David Osborne

COORDINATOR/PROFESSOR, HERITAGE & TRADES
CONSTRUCTION
ALGONQUIN COLLEGE

Herb Stovel

HERITAGE CONSERVATION CO-ORDINATOR
SCHOOL OF CANADIAN STUDIES
CARLETON UNIVERSITY

Dennis Ryan

DIRECTOR OF INDUSTRY HUMAN RESOURCES
CANADIAN CONSTRUCTION ASSOCIATION

Peter Woods

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Appendix B

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Appendix C

ICOMOS

Guidelines for Education and Training in the Conservation of Monuments, Ensembles and Sites

The General Assembly of the International Council on Monuments and Sites, ICOMOS, meeting in Colombo, Sri Lanka, at its tenth session from July 30 to August 7, 1993;

Considering the breadth of the heritage encompassed within the concept of monuments, ensembles and sites;

Considering the great variety of actions and treatments required for the conservation of these heritage resources, and the necessity of a common discipline for their guidance;

Recognizing that many different professions need to collaborate within the common discipline of conservation in the process and require proper education and training in order to guarantee good communication and coordinated action in conservation;

Noting the Venice Charter and related ICOMOS doctrine, and the need to provide a reference for the institutions and bodies involved in developing training programmes, and to assist in defining and building up appropriate standards and criteria suitable to meet the specific cultural and technical requirements in each community or region;

Adopts the following guidelines, and Recommends that they be diffused for the information of appropriate institutions, organizations and authorities.

Aim of the Guidelines

1. The aim of this document is to promote the establishment of standards and guidelines for education and training in the conservation of monuments, groups of buildings (“ensembles”) and sites defined as cultural heritage by the World Heritage Convention of 1972. They include historic buildings, historic areas and towns, archaeological sites, and the contents therein, as well as historic and cultural landscapes. Their conservation is now, and will continue to be a matter of urgency.

Conservation

2. Conservation of cultural heritage is now recognized as resting within the general field of environmental and cultural development. Sustainable management strategies for change which respect cultural heritage require the integration of conservation attitudes with contemporary economic and social goals including tourism.
3. The object of conservation is to prolong the life of cultural heritage and, if possible, to clarify the artistic and historical messages therein without the loss of authenticity and meaning. Conservation is a cultural, artistic, technical and craft activity based on humanistic and scientific studies and systematic research. Conservation must respect the cultural context.

Educational and Training Programmes and Courses

4. There is a need to develop a holistic approach to our heritage on the basis of cultural pluralism and diversity, respected by professionals, craftspersons and administrators. Conservation requires the ability to observe, analyze and synthesize. The conservationist should have a flexible yet pragmatic approach based on cultural consciousness which should penetrate all practical work, proper education and training, sound judgement and a sense of proportion with an understanding of the community’s needs. Many professional and craft skills are involved in this interdisciplinary activity.

5. Conservation works should only be entrusted to persons competent in these specialist activities. Education and training for conservation should produce from a range of professionals, conservationists who are able to:
- read a monument, ensemble or site and identify its emotional, cultural and use significance;
 - understand the history and technology of monuments, ensembles or sites in order to define their identity, plan for their conservation, and interpret the results of this research;
 - understand the setting of a monument, ensemble or site, their contents and surroundings, in relation to other buildings, gardens or landscapes;
 - find and absorb all available sources of information relevant to the monument, ensemble or site being studied;
 - understand and analyze the behaviour of monuments, ensembles and sites as complex systems;
 - diagnose intrinsic and extrinsic causes of decay as a basis for appropriate action;
 - inspect and make reports intelligible to non-specialist readers of monuments, ensembles or sites, illustrated by graphic means such as sketches and photographs;
 - know, understand and apply Unesco conventions and recommendations, and ICOMOS and other recognized Charters, regulations and guidelines;
 - make balanced judgements based on shared ethical principles, and accept responsibility for the long-term welfare of cultural heritage;
 - recognize when advice must be sought and define the areas of need of study by different specialists, e.g. wall paintings, sculpture and objects of artistic and historical value, and/or studies of materials and systems;
 - give expert advice on maintenance strategies, management policies and the policy framework for environmental protection and preservation of monuments and their contents, and sites;
 - document works executed and make same accessible;
 - work in multi-disciplinary groups using sound methods;
 - be able to work with inhabitants, administrators and planners to resolve conflicts and to develop conservation strategies appropriate to local needs, abilities and resources.

Aim of Courses

6. There is a need to impart knowledge of conservation attitudes and approaches to all those who may have a direct or indirect impact on cultural property.
7. The practice of conservation is interdisciplinary; it therefore follows that courses should also be multi-disciplinary. Professionals, including academics and specialized craftspersons, who have already received their normal qualification will need further training in order to become conservationists; equally those who seek to act competently in historic environment.
8. Conservationists should ensure that all artisans and staff working on a monument, ensemble or site respect its significance.
9. Training in disaster preparedness and in methods of mitigating damage to cultural property, by strengthening and improving fire prevention and other security measures, should be included in courses.
10. Traditional crafts are a valuable cultural resource. Craftspersons, already with high level manual skills, should be further trained for conservation work with instruction in the history of their craft, historic details and practices, and the theory of conservation with the need for documentation. Many historic skills will have to be recorded and revived.

Organization of Education and Training

11. Many satisfactory methods of achieving the required education and training are possible. Variations will depend on traditions and legislation, as well as on administrative and economic context of each cultural region. The active exchange of ideas and opinions on new approaches to education and training between national institutes and at international levels should be encouraged. Collaborative network of individuals and institutions is essential to the success of this exchange.
12. Education and sensitization for conservation should begin in schools and continue in universities and beyond. These institutions have an important role in raising visual and cultural awareness – improving ability to read and understand the elements of our cultural heritage – and giving the cultural preparation needed by candidates for specialist education and training. Practical hands-on training in craft work should be encouraged.
13. Courses for continuing professional development can enlarge on the initial education and training of professionals. Long-term, part-time courses are a valuable method for advanced teaching, and useful in major population centres. Short courses can enlarge attitudes, but cannot teach skills or impart profound understanding of conservation. They can help introduce concepts and techniques of conservation in the management of the built and natural environment and the objects within it.
14. Participants in specialist courses should be of a high calibre normally having had appropriate education and training and practical working experience. Specialist courses should be multidisciplinary with core subjects for all participants, and optional subjects to extend capacities and/or to fill the gaps in previous education and training. To complete the education and training of a conservationist an internship is recommended to give practical experience.
15. Every country or regional group should be encouraged to develop at least one comprehensively organized institute giving education and training and specialist courses. It may take decades to establish a fully competent conservation service. Special short-term measures may therefore be required, including the grafting of new initiatives onto existing programmes in order to lead to fully developed new programmes. National, regional and international exchange of teachers, experts and students should be encouraged. Regular evaluation of conservation training programmes by peers is a necessity.

Resources

16. Resources needed for specialist courses may include e.g.:
 - an adequate number of participants of required level ideally in the range of 15 to 25;
 - a full-time co-ordinator with sufficient administrative support;
 - instructors with sound theoretical knowledge and practical experience in conservation and teaching ability;
 - fully equipped facilities including lecture space with audio-visual equipment, video, etc. studios, laboratories, workshops, seminar rooms, and staff offices;
 - library and documentation centre providing reference collections, facilities for coordinating research, and access to computerized information networks;
 - a range of monuments, ensembles and sites within a reasonable radius.
17. Conservation depends upon documentation adequate for understanding of monuments, ensembles or sites and their respective settings. Each country should have an institute for research and archive for recording its cultural heritage and all conservation works related thereto. The course should work within the archive responsibilities identified at the national level.
18. Funding for teaching fees and subsistence may need special arrangements for mid-career participants as they may already have personal responsibilities.

Appendix D

Built Heritage Sector

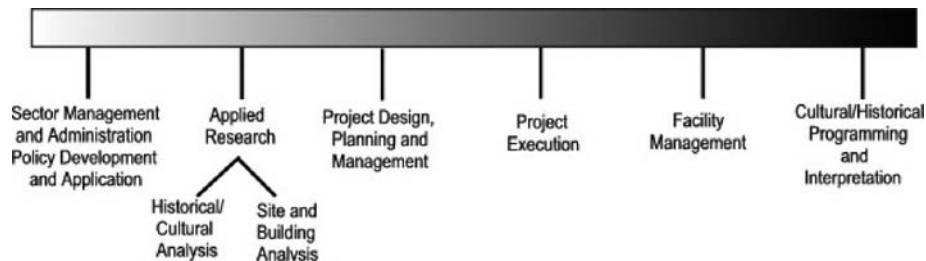
This Conceptual Outline proposes an approach to mapping the occupations that are central to the Built Heritage Sector and suggests the analytical tasks that stem from this mapping.

The Built Heritage Continuum:

Figure No. 1 portrays the continuum of a built heritage project. The stages are portrayed as a continuum to emphasize that while the stages are analytically discrete, the functions undertaken by individuals often overlap these stages.

Figure No. 1

Continuum of a Built Heritage Project



- *Sector Management and Administration / Policy Development and Application* comprises those professional functions related to developing regulatory and policy frameworks, applying regulations and policies to specific applications that involve approval requirements, and undertaking analytical and consulting studies pertinent to policy and strategy.
- *Applied Research* encompasses two distinct types of research and analysis. The first pertains to an analysis of the cultural or historical significance of a particular project. The second entails a physical examination of the site to obtain the technical information necessary for preservation, restoration, rehabilitation, expansion, etc.
- *Project Design, Planning and Management* involves the development of a specific plan for preservation, restoration, rehabilitation or expansion and (where relevant) subsequent management of a heritage site.
- *Project Execution* involves the implementation of a design plan. Project execution skills are predominantly those associated with various branches of the construction industry. Built heritage projects often require specialized skills and understanding on the part of contractors and skill tradespersons and craftpersons.
- *Facility Management* involves development and implementation of a preventive maintenance programme and general asset management with an emphasis on preservation. Both technical skills and business skills involved.
- *Cultural Historical Programming and Interpretation* involves the development and delivery of content programming pertinent to the project and the production of interpretive materials to communicate the sites cultural or historical significance.

Specialized Functions and Specialized Occupations:

Two types of occupations are prevalent in the Built Heritage Sector. The first are occupations that involve specialized functions that are a sub-set of functions commonly associated with occupations that are already regulated or certified in some manner. Examples of such occupations would be architects who undertake the design and management of heritage projects or masons who perform restoration work. In both cases, specialized skills are required. However, these specialized skills are best understood as a sub-set of the skills that are commonly associated with the respective occupations and are already addressed (perhaps inadequately) by existing occupational standards.

The second type of occupation are those specialized occupations that principally involve functions or skills that are distinct to the built heritage sector. These occupations would not exist, in the absence of the built heritage sector. In this Occupational Mapping, these specialized occupations would be:

SEGMENT IN BUILT HERITAGE PROJECT CONTINUUM	SPECIALIZED OCCUPATIONS (Unique to or substantially engaged in the Built Heritage Sector)
Sector Management and Administration/ Policy Development and Application	Heritage Planners and Administrators at various levels
Applied Research	Architectural Historians Cultural Landscapers Archaeologists Conservators
Project Execution	Leaded Glass Restorers Stone Carvers
Cultural and Historical Programming and Interpretation	Heritage Site Programme Managers and Administrators Guides

Occupational Mapping

Sector Management and Administration / Policy Development and Application:

- Heritage Planners and Administrators (various levels)
- Urban Planners
- Educators, chiefly in the urban planning and architectural field

A key group of occupations in this segment of the Built Heritage Project Continuum are the Heritage Planners and Administrators (provisional title).¹ The distinguishing skills and functions of these occupations pertain to knowledge of statutes, international conventions, regulations, programmes, policies and goals pertinent to the Built Heritage Sector. Individuals in these occupations are employed principally by the public sector or work as independent consultants. These individuals are typically university trained in architecture, urban planning, engineering or fine art. Their functions bridge both the applied natural sciences and the humanities. At present, these individuals acquire the preponderance of the skills that are specific to their employment in the Built Heritage Sector through experience, although some university graduate programmes may now be covering aspects of the skills required.

For this segment of the Built Heritage Continuum, the principal analytical task will be:

- to define the functions and requisite skill-sets of Heritage Planners and Administrators, to document their prior training and professional formation, and to ascertain how this occupation may be best captured in the system of National Occupational Classifications.
- to identify the specific skills pertinent to the Built Heritage Sector that are applicable to Urban Planners

Applied Research:

The occupations in this segment of the Built Heritage continuum are chiefly engaged in obtaining technical data relevant to the appraisal of a site and to the formulation of a strategy for preservation, restoration, rehabilitation or expansion.

The occupations may be further sub-classed as follows:

Historical and Cultural Analysis:

- Architectural Historians
- Archivists / Historical Researchers
- Archaeologists
- Cultural Landscapers
- Historical Geographers
- Building Historians

Site and Building Analysis:

- Engineers:
- Electrical
- Mechanical
- Structural
- Civil
- Engineering and Architectural Technologists
- Environmental and Hazardous Waste Consultants
- Architects
- Landscape Architects
- Cost Consultants / Quantity Surveyors
- Photogrammetrists
- Materials Testers (also relevant to Facility Management)

In the case of those occupations involved in site analysis, the relevant skills and functions are specialized sub-sets of skills that are more generally associated with the occupation or profession. For those persons in occupations involved in historical and cultural analysis of a site, specialized skills may reflect graduate training or career experience.

For the Applied Research segment of the Built Heritage Continuum, the principal analytical task will be to identify the specialized skill-sets that are most relevant to these occupations. Subject to Steering Committee direction, it is proposed to give priority to the occupations engaged in site analysis.

Project Design, Planning and Management:

The principal occupations in this segment of the continuum are:

- Architects
- Landscape Architects
- Interior Designers
- Engineers:
 - Electrical
 - Mechanical
 - Structural
 - Civil
- Environmental and Hazardous Waste Consultants
- Cost Consultants / Quantity Surveyors

In the private sector, Developers play a key role.

Statutory provisions reserve certain aspects of project design to licensed professional, i.e., engineers or architects. While often associated with these professions, project management is not statutorily restricted to any particular occupation. (Field work will determine the predominant practice.)

In all cases, existing regulatory regimes (statutory and non-statutory) apply to these occupations. The pertinent skills are best understood as specialized sub-sets of skills otherwise associated at a more generic level with the occupation.

The key analytical task for this segment of the Built Heritage continuum will be identifying and defining these specialized skill-sets.

Project Executions:

Depending on the nature and scale of a project, contractors in all branches of construction as well as all (or virtually) crafts and trades may be involved. The most relevant criteria in prioritizing the branches of construction and the trades is the degree to which the Built Heritage Sector requires specialized skills owing to the nature of the materials or the degree of craft proficiency required to construct (as opposed to install) components. On this basis, it is proposed that the key trades and branches of construction are:

1. Stone, Brick Work and Terracotta:

- stone masons
- bricklayers
- stone cutters
- stone carvers

2. Concrete Work:

- restoration cement finishers

3. Metalworking:

- sheet metal workers experienced in metals such as copper, lead, tin, and galvanized iron
- ironworkers

4. Woodworking:

- finish carpenters
- framers (traditional post and beam framing)
- lathers

5. Marble, Tile, and Terrazzo Work:

- marble workers
- tile workers
- terrazzo workers

6. Glass Work:

- glaziers
- leaded glass restorers

7. Traditional Roofing Systems:

- slate roofing installers
- wood shingle installers

8. Painting and Decorating:

- plasterers
- painters

9. Mechanical Trades

- plumbers / pipefitters
- electricians
- HVAC installers

10. Project Managers

In the case of the electrical and mechanical trades, the primary issues pertain to design and specification not to particular manner of working with materials or to working procedures. Design and specification is undertaken by engineers and architects, not by the trades.

A further important function in this segment of the Built Heritage Project Continuum is the role played by General Contractors. (General contracting is more accurately described as a function, rather than an occupation.)

For this segment of the Built Heritage Project Continuum, the key analytical task is to identify and define the specialized skill-sets in relation to particular building materials.

Facility Management:

In this context the title Facility Management pertains to the management of the physical structure, not to the management of cultural programmes, etc. that may be delivered within the physical structure. In smaller projects, however, Facility Management functions may be combined with Programme Management. Larger entities may require persons with specialized engineering or architectural skills to manage a portfolio of sites.

The analytical task is first to identify the extent to which Facility Management of Built Heritage sites has been professionalized, and second, to identify the specialized skill-sets that are pertinent to Facility Management in the context of a heritage structure.

Cultural and Historical Programming and Interpretation:

- Heritage Site Programme Managers and Administrators
- Guides
- Marketing Managers

Cultural and Historical Programming involves the management and delivery of interpretive programmes related to a heritage site. These include the production of written materials, audio-visual materials, displays and exhibits, related cultural programmes, and guide services for visitors. Heritage Programme Managers may also co-ordinate group tours of heritage sites. Marketing Managers develop promotion materials for heritage sites.

Relationship of Occupational Mapping to System of National Occupational Classifications

The system of National Occupational Classifications is used to identify occupations in the labour force. The system is structured in terms of nine skill types and four skill levels. Within each cell in this matrix occupations are grouped by digit levels that reflect increasing degrees of definition. The published occupational descriptions in the NOC system are taken to the four-digit level. Survey data is only available at the four-digit level. Depending on the sample size, confidentiality requirements may result in data being suppressed at the regional or industrial level.

The field work interviews and focus groups will refine and alter the occupational mapping set out in this conceptual outline and the skill-sets identified with the various occupations. Following this field work, the results will be compared with the NOC system with a view to mapping the occupations in the Built Heritage Sector into the NOC system. The results of this mapping cannot be pre-judged and may or may not lead to proposals for new NOC occupations at the five-digit level.

¹ The job titles “Heritage Planner - Land Use” and “Heritage Work Planner” are currently examples titles for Urban and Land Use Planners in the NOC system. Subsequent interview and focus group research may confirm or modify this occupational classification.

Appendix E

Occupational Profiles

Heritage Planners, Administrators, and Consultants – Senior Managers

Overview of Occupation:

Heritage Planners, Administrators, and Consultants are professional occupations that are unique to the built heritage sector. Persons in these occupations may be employed by governments, non-governmental organizations, or work as consultants.

At the senior management level, persons in these occupations:

- review and propose policies and regulations related to the development and ongoing management of the built heritage sector to elected and appointed decision-makers,
- establish operating policies within their mandate,
- determine research priorities,
- award consulting contracts,
- subject to tendering procedures, oversee tendering and award of contracts related to restoration or preservation work on heritage sites,
- review and propose strategic plans for the built heritage sector,
- propose and administer departmental and organizational budgets,
- lead committees,
- manage other professional and technical staff,
- advocate on behalf of the built heritage sector.

Training and Education:

Heritage Planners, Administrators, and Consultants typically have university level training at the under-graduate or post-graduate level in:

- architecture,
- urban planning,
- archaeology/anthropology,
- history,
- geography,
- museum studies,
- fine arts,
- archival science.

Some universities offer courses or specialized programs in built heritage conservation, though these do not cover the policy oriented skills required in this occupation.

Occupational or Professional Regulation:

- At present, there are no occupational standards or regulations pertinent to designation or certification as Heritage Planners, Administrators, and Consultants.
- For private consultants, the Canadian Association of Professional Heritage Consultants maintains a voluntary registry of private consultants. Inclusion in the registry requires a relevant university degree, 3-5 years of practical experience, and adherence to a code of professional conduct.

Key Skills:

- Knowledge of relevant statutes and regulations pertinent to built heritage structures, municipal planning and the environment.
- Knowledge of relevant international conventions.
- Knowledge of conservation standards and guidelines.
- Knowledge of policy processes.
- In depth understanding of cultural and economic role of built heritage sector and conservation philosophies.
- Ability to develop strategic plans.
- Other professional skills including the ability to develop and administer budgets, manage staff, and lead committees.

Potential Issues:

- At the senior managerial level, this occupation requires both technical competence in matters related to administration of the built heritage sector and also general managerial competence and policy competence.
- There are no generally recognized occupational standards addressing the technical competence aspects of this occupation. As a consequence, there is a dearth of professional training focused on the specific technical skill needs of this occupation.
- With respect to technical skills, there is no certification of competence based on evaluation of professional training and professional experience.
- The degree to which occupational standards should apply to both public sector employees and private consultants.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Canadian Association of Professional Heritage Consultants (CAPHC) <http://www.caphc.ca/>

NOC:

- In the public sector the most relevant NOC classifications are:
 - 0411 Government Manager – Health and Social Policy Development and Program Administration
 - 2153 Urban and Land User Planners

Heritage Planners, Administrators, and Consultants – Middle Managers

Overview of Occupation:

- Heritage Planners, Administrators, and Consultants are professional occupations that are unique to the built heritage sector. Persons in these occupations may be employed by governments, non-governmental organizations, or work as consultants.
- At the middle management level, persons in these occupations:
 - develop and propose to senior managers policies and regulations related to the development and ongoing management of the built heritage sector,
 - recommend operating policies,
 - administer research efforts and recommend priorities,
 - recommend consulting contracts,
 - subject to tendering procedures, administer tendering and award of contracts related to restoration or preservation work on heritage sites, subject to senior managerial approval
 - develop and recommend strategic plans for the built heritage sector,
 - develop and administer departmental budgets,
 - support, coordinate and lead committees,
 - work with and manage other professional and technical staff,
 - advocate on behalf of the built heritage sector.

Training and Education:

- Heritage Planners, Administrators, and Consultants typically have university level training at the under-graduate or post-graduate level in:
 - architecture,
 - urban planning,
 - archaeology/anthropology,
 - history,
 - geography,
 - museum studies,
 - fine arts,
 - archival science.
- Some universities offer courses or specialized programs in built heritage conservation, though these do not cover the policy oriented skills required in this occupation.

Occupational or Professional Regulation:

- At present, there are no occupational standards or regulations pertinent to designation or certification as Heritage Planners, Administrators, and Consultants.
- For private consultants, the Canadian Association of Professional Heritage Consultants maintains a voluntary registry of private consultants. Inclusion in the registry requires a relevant university degree, 3-5 years of practical experience, and adherence to a code of professional conduct.

Key Skills:

- Knowledge of relevant statutes and regulations pertinent to built heritage structures, municipal planning and the environment.
- Knowledge of relevant international conventions.
- Knowledge of conservation standards and guidelines.
- Knowledge of policy processes.
- Ability to assess individual sites or projects in light of relevant statutes, regulations, policies and strategic plans.
- In depth understanding of cultural and economic role of built heritage sector and conservation philosophies.
- Ability to develop strategic plans.
- Other professional skills including the ability to develop and administer budgets, manage staff, and lead committees.

Potential Issues:

- At the senior managerial level, this occupation requires both technical competence in matters related to administration of the built heritage sector and also general managerial competence and policy competence.
- There are no generally recognized occupational standards addressing the technical competence aspects of this occupation. As a consequence, there is a dearth of professional training focused on the specific technical skill needs of this occupation.
- With respect to technical skills, there is no certification of competence based on evaluation of professional training and professional experience.
- The degree to which occupational standards should apply to both public sector employees and private consultants.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Canadian Association of Professional Heritage Consultants (CAPHC) <http://www.caphc.ca/>

NOC:

- In the public sector the most relevant NOC classifications are:
 - 0411 Government Manager – Health and Social Policy Development and Program Administration
 - 2153 Urban and Land User Planners

Heritage Planners, Administrators, and Consultants – Non-Managerial

Overview of Occupation:

- Heritage Planners, Administrators, and Consultants are professional occupations that are unique to the built heritage sector. Persons in these occupations may be employed by governments, non-governmental organizations, or work as consultants.
- At the technical or non-managerial level, persons in these occupations:
 - conduct research relevant to the formulation of policies and regulations related to the development and ongoing management of the built heritage sector,
 - support committees,
 - work with other professional and technical staff,
 - assess individual sites or projects in light of relevant statutes, regulations, policies and strategic plans and make recommendations to program or policy managers.

Training and Education:

- Heritage Planners, Administrators, and Consultants typically have university level training at the undergraduate or post-graduate level in:
 - architecture,
 - urban planning,
 - archaeology/anthropology,
 - history,
 - geography,
 - museum studies,
 - fine arts,
 - archival science.
- Some universities offer courses or specialized programs in built heritage conservation, though these do not cover the policy oriented skills required in this occupation.

Occupational or Professional Regulation:

- At present, there are no occupational standards or regulations pertinent to designation or certification as Heritage Planners, Administrators, and Consultants.
- For private consultants, the Canadian Association of Professional Heritage Consultants maintains a voluntary registry of private consultants. Inclusion in the registry requires a relevant university degree, 3-5 years of practical experience, and adherence to a code of professional conduct.

Key Skills:

- Knowledge of relevant statutes and regulations pertinent to built heritage structures, municipal planning and the environment.
- Knowledge of relevant international conventions.
- Knowledge of conservation standards and guidelines.
- Ability to assess individual sites or projects in light of relevant statutes, regulations, policies and strategic plans.
- Understanding of cultural and economic role of built heritage sector and conservation philosophies.
- Ability to prepare reports and briefing notes.

Potential Issues:

- At the senior managerial level, this occupation requires both technical competence in matters related to administration of the built heritage sector and also general managerial competence and policy competence.
- There are no generally recognized occupational standards addressing the technical competence aspects of this occupation. As a consequence, there is a dearth of professional training focused on the specific technical skill needs of this occupation.
- With respect to technical skills, there is no certification of competence based on evaluation of professional training and professional experience.
- The degree to which occupational standards should apply to both public sector employees and private consultants.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

Canadian Association of Professional Heritage Consultants (CAPHC) <http://www.caphc.ca/>

NOC:

- In the public sector the most relevant NOC classifications are:
 - 0411 Government Manager – Health and Social Policy Development and Program Administration
 - 2153 Urban and Land User Planners

Urban Planners

Overview of Occupation:

- When employed by governments, Urban Planners develop and administer policies related to land and site use. In the private sector, Urban Planners assist private developers in devising and presenting development proposals consistent with land use plans, or when necessary, seeking exemption from official plans.
- This occupation is not specific or unique to the built heritage sector.
- Urban Planners are directly involved with the built heritage sector in so far as official land use plans take account (or fail to take account) of the built heritage sector.
- In municipal governments, primary responsibility for developing and administering policies for the built heritage sector may rest with persons employed as Urban Planners.

Training and Education:

- Urban Planners typically have university level training at the undergraduate or post-graduate level in:
 - urban planning,
 - architecture,
 - geography
- Some university programmes offer courses in built heritage conservation, though, in the main, these are not mandatory.

Occupational or Professional Regulation:

- The profession is regulated at the provincial level. In some provinces, a reserved title, e.g., “Registered Professional Planner” is available to persons who meet training and experience eligibility criteria.

Key Skills unique to the Built Heritage Sector:

- Knowledge of relevant statutes and regulations pertinent to built heritage structures.
- Familiarity with conservation standards and guidelines.
- Familiarity with cultural and economic role of built heritage sector and exposure to conservation philosophies.
- Ability to review proposals involving built heritage sites.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Canadian Institute of Planners is the national body representing seven counterpart associations/institutes/ordre (6 provincial associations, plus one Atlantic association). <http://www.cip-icu.ca/>

Potential Issues:

- At present, certification in this occupation does not require any substantive familiarity with the built heritage sector or the potential developmental uses of built heritage structures.
- At present, training for this occupation does not require exposure to the cultural and economic role of the built heritage sector or the adaptation of built heritage structures to modern uses.

NOC:

- 2153 Urban and Land User Planners

Architectural Historians

Overview of Occupation:

- Architectural historians are employed chiefly by architectural faculties and fine arts departments of universities and colleges. Architectural historians may also work for governments and heritage organizations as employees or consultants.
- Architectural historians have general knowledge of trends in architectural style, construction strategy, and the use of building materials across periods and regions.
- Architectural historians typically have specialized knowledge of particular periods or regions.
- Larger governments that manage a significant portfolio of actual and potential heritage sites may directly employ architectural historians.

Training and Education:

- Architectural historians usually have a post-graduate degree. Some architectural historians will have undergraduate training in architecture, although training in history and fine arts is also common.

Occupational or Professional Regulation:

- The occupation is not regulated by statute. Tenured faculty positions are governed by university policies and traditions.
- Architectural historians who may also be registered architects and, as such, would be licensed per the description for architects.

Key Skills unique to the Built Heritage Sector:

- Understanding of analytical principles of historical research.
- Ability to prepare or review assessments of built heritage sites from the perspective of their significance as representatives of particular architectural styles or periods.
- Familiarity with the principles underlying the relevant statutes and regulations pertinent to built heritage structures.
- Familiarity with international conventions.
- Knowledge of conservation standards and guidelines.
- Knowledge of the cultural and economic role of built heritage sector.
- Knowledge of conservation philosophies.

Associations or Administrative Bodies concerned with Professional or

Occupational Standards, Licensing or Certification:

- See the description for architects. This is relevant only for those architectural historians who are also registered architects.

NOC:

- 4121 University Professor

Potential Issues:

- Some faculty may not regard the statutory and regulatory framework as falling within the purview of their discipline.

Archivists, Historical Researchers

Overview of Occupation:

- Archivists and historical researchers review primary source materials and published monographs, studies, etc. for information on the specific historical significance and historical context of built heritage sites.
- Larger governments that manage a significant portfolio of actual and potential heritage sites may directly employ archivists and historical researchers.
- Archival and historical research may also be carried out by college or university faculty.
- Archivists and historical researchers may also work as independent consultants.

Training and Education:

- Historical researchers have an undergraduate or (more commonly) a post-graduate degree in Canadian history.
- Archivists have a university degree and college certification in archival studies or a post-graduate degree in archival studies or information science.

Occupational or Professional Regulation:

- Neither historical researchers nor archivists are regulated professions.

Key Skills unique to the Built Heritage Sector:

- Understanding of analytical principles of historical research.
- Ability to prepare or review assessments of built heritage sites from the perspective of their historical significance including an understanding of the historical context of personages or events relevant to the site.
- Ability to locate, research and interpret primary sources.
- Relevant language skills.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- The Association of Canadian Archivists publishes a Code of Ethics and undertakes professional development activities, but does not certify or otherwise regulate the profession. Membership is open to any person or organization engaged in archival activity.

NOC:

- 5113 Archivists
- 4169 Other Professional Occupations in Social Science n.e.c.

Potential Issues:

- Archival and historical research related to most built heritage sites is a one-time activity, rather than an ongoing activity. At present, there is insufficient work in this field to support a specialized occupation comprising a significant number of persons whose principal activity is applied research related to built heritage sites.

Cultural Landscapers

Overview of Occupation:

- Cultural landscapers have general knowledge of trends in landscaping style, types of vegetation and materials that were typical during various periods, and the manner in which landscaped space was used.
- Larger governments that manage a significant portfolio of actual and potential heritage sites may directly employ cultural landscapers. In the main, however, cultural landscapers are employed on a consulting basis. Some cultural landscapers may hold faculty positions.

Training and Education:

- Cultural landscapers usually have a post-graduate degree in landscape architecture or fine art.

Occupational or Professional Regulation:

- Cultural landscapers may also be registered landscape architects. Landscape architect is a reserved title or licensed profession in all provinces. See description under Landscape Architects.

Key Skills unique to the Built Heritage Sector:

- Understanding of analytical principles of historical research.
- Understanding of period-specific landscape design and the use of landscaped space.
- Understanding of conservation and restoration philosophies.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Certification of landscape architects is administered by provincial bodies. There is no certification per se for cultural landscapers.

NOC:

- 4121 University Professor
- 2152 Landscape Architects

Potential Issues:

- Aside from possible shortages in some regions, there are no distinct human resource issues.

Archaeologists

Overview of Occupation:

- Archaeologists are employed by governments and heritage institutions. Many archaeologists also hold faculty positions in colleges and universities. Some archaeologists also work in private heritage consultancies.
- When required by statute, archaeologists assess sites prior to development activities that may disturb or destroy archaeological remains. Where assessments warrant, subsequent field work may be undertaken.
- Archaeologists also provide cultural and historical interpretation based on artefacts.

Training and Education:

- Archaeologists have an undergraduate or (more commonly) a post-graduate degree in archaeology.

Occupational or Professional Regulation:

- In B.C., though not in other provinces, the profession has a restricted title, “Registered Professional Consulting Archaeologist.” Registration is dependent on meeting minimum educational and experience requirements and accepting a code of practice.
- In other provinces, professional associations exist. These associations, however, do not have any statutory authority.

Key Skills unique to the Built Heritage Sector:

- Ability to prepare or review archaeological assessments of built heritage sites.
- Ability to undertake or manage archaeological field work.
- Knowledge of conservation standards and techniques.
- Relevant language skills.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- In B.C., the B.C. Association of Professional Consulting Archaeologists maintains a professional register and confers use of the restricted title, “Registered Professional Consulting Archaeologist”
- In other provinces, there are professional associations. However, these associations have no regulatory function.

NOC:

- 4169 Other Professional Occupations in Social Science n.e.c.

Potential Issues:

- All jurisdictions have legislation protecting archaeological sites and artefacts. Typically this legislation requires an archaeological assessment prior to major development or construction activity. It is common, although not universal, that when a review is statutorily mandated, there are also regulation-supported occupational standards applicable to persons who conduct that review. In Canada, in the archaeology field, this applies at present only in B.C.

Historical Geographers

Overview of Occupation:

- Historical geographers study the historical use of land and natural resources and the way in which this use shaped settlement patterns and socio-economic development.
- Larger governments that manage a significant portfolio of actual and potential heritage sites may directly employ historical geographers. In the main, however, historical geographers hold faculty positions and are employed by governments and heritage institutions on a consulting basis.

Training and Education:

- Historical geographers usually have a post-graduate degree in geography or anthropology.

Occupational or Professional Regulation:

- There is no occupational or professional regulation.

Key Skills unique to the Built Heritage Sector:

- Understanding of analytical principles of historical research.
- Understanding of analytical principles of social and cultural geography.
- Understanding of historical periods.
- Understanding of conservation and restoration philosophies.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- The Canadian Association of Geographers provides networking opportunities, but is not involved in setting or administering occupational or professional standards.

NOC:

- 4121 University Professor
- 4169 Other Professional Occupations in the Social Sciences

Potential Issues:

- Aside from possible shortages in some regions, there are no distinct human resource issues.

Building Historians

Overview of Occupation:

- Building historians study the use of structures over time and propose ways of replicating that use, where appropriate. This is distinct from studying the aesthetic or architectural characteristics of structures.
- Larger governments that manage a significant portfolio of actual and potential heritage sites may directly employ building historians. In the main, however, building historians hold faculty positions and are employed by governments and heritage institutions on a consulting basis.

Training and Education:

- Building historians usually have a post-graduate degree in history or anthropology.

Occupational or Professional Regulation:

- There is no occupational or professional regulation.

Key Skills unique to the Built Heritage Sector:

- Understanding of analytical principles of historical research.
- Understanding of historical periods.
- Understanding of conservation and restoration philosophies.

NOC:

- 4121 University Professor
- 4169 Other Professional Occupations in the Social Sciences

Potential Issues:

- Aside from possible shortages in some regions, there are no distinct human resource issues.

Engineers

Overview of Occupation:

- Engineers assess and design structural, electrical and mechanical aspects of a building, according to their professional training and specialization. In the built heritage structure, the relevant engineering specializations are: civil, structural, electrical and mechanical.
- Some civil or structural engineers may specialize in engineering of building envelopes. In some jurisdictions a building envelope appraisal is required by regulation.
- Engineers also specify materials and other tests relevant to the safety and integrity of a physical structure.
- Engineers undertake cost/benefit analysis of alternative design or construction strategies.
- In some circumstances, engineers may also undertake project management functions.

Training and Education:

- Professional engineers have an undergraduate in engineering.

Occupational or Professional Regulation:

- In all provinces, the design and assessment of structural, electrical and mechanical systems are restricted by statute to licensed engineers. Some jurisdictions also require assessment of building envelope by a licensed engineer qualified in this field. Licensing is administered by provincial associations/ordre.
- Licensure is dependent on holding a recognized undergraduate engineering degree, meeting experience requirements, passing professional examinations, and accepting a code of practice.
- In some provinces, licensure also applies to consultancies.

Key Skills unique to the Built Heritage Sector::

- Familiarity with suppliers and trade contractors in their area of specialization.
- Understanding of period-specific construction technologies and materials.
- Ability to integrate building code objectives and retro-fitting or repair with the cultural and historical integrity of a built heritage structure.
- Understanding of conservation standards.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Professional associations/ordre exist in all provinces and territories for the purpose of administering the system of professional licensure.
- In most provinces, licensure and professional development or advocacy are undertaken by the same organization. In other provinces, these functions are separated.

NOC:

- 2131 Civil Engineers
- 2132 Mechanical Engineers
- 2133 Electrical and Electronics Engineers

Potential Issues:

- Engineers acquire skills that are uniquely relevant to the built heritage sector through experience. There is no specialized certification or specialized professional training available to engineers.

Architects

Overview of Occupation:

- Architects develop designs and strategies for the repair, restoration and renovation of built heritage structures. These strategies may apply to the façade, to the visible interior, to non-visible systems, and to structural additions. Designs and strategies will reflect the degree of original preservation suitable to the intended use of the structure. This may range from full preservation of original structural, mechanical and aesthetic features to a modernization that preserves only some or all of the original aesthetic features.
- Architects undertake cost/benefit analysis of alternative design or construction strategies.
- In most circumstances, architects also undertake project management functions.

Training and Education:

- Architects have an undergraduate degree in architecture
- Architectural faculties commonly offer courses at the graduate and undergraduate level in architectural history and in the preservation and restoration of built heritage structures. However, in many faculties, these courses are only emerging. There is no standardization of curricula. Nor are these courses typically compulsory.
- In some universities, specialized post-graduate training is available.

Occupational or Professional Regulation:

- In all provinces, architectural practice is restricted by statute to licensed architects. Licensing is administered by provincial associations/ordre.
- Architects practising in the built heritage sector often seek registration with the Canadian Association of Professional Heritage Consultants. This registration is voluntary. Registration with CAPHC requires a relevant university degree and experience.

Key Skills unique to the Built Heritage Sector:

- Familiarity with suppliers and trade contractors with experience in built heritage projects.
- Understanding of period-specific construction technologies and materials.
- Ability to integrate building code compliance and retro-fitting or repair with the cultural and historical integrity of a built heritage structure.
- Knowledge of the relevant statutes and regulations pertinent to built heritage structures.
- Knowledge of international conventions.
- Knowledge of the cultural and economic role of built heritage sector.
- Knowledge of conservation and restoration philosophies.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Architecture is a licensed profession. Professional licensing falls within provincial jurisdiction and is administered by provincial bodies.
- To qualify at the provincial level, an applicant's educational qualifications must be accepted by the Canadian Architectural Certification Board (CACB). The CACB certifies architectural programmes at Canadian universities and assesses foreign architectural degrees.
- After being certified by the CACB, an applicant must fulfill a supervised internship for a period prescribed by the provincial regulating body. All provincial associations require an Internship with a minimum of 5,600 hours of Canadian work experience in specified areas of architectural practice.
- After completion of the internship, an applicant must pass a National Architect Registration Examination. (Note that Quebec has a separate examination).
- In some provinces, there are additional requirements, such as an admission course or an oral examination.
- In principal, an architect may meet the educational requirements through an extended apprenticeship that covers the syllabus of the Royal Architectural Institute of Canada. In practice the apprenticeship route is rarely used.

NOC:

- 2151 Architects

Potential Issues:

- While there are numerous architects that practice in the field of built heritage structures, there are no occupational standards or specialized certifications for architectural practice related to built heritage work. Architectural plans and proposals are the key conceptual framework for a construction intervention in a built heritage structure. There is also an absence of standardization of built heritage related curricula at the undergraduate level.

Engineering and Architectural Technologists

Overview of Occupation:

- Engineering and architectural technologists work under the direction of a professional engineer or architect, respectively.
- Engineering and architectural technologists assist engineers and architects in design work and project management.

Training and Education:

- Engineering and architectural technologists are graduates of three-year college technologist programmes.

Occupational or Professional Regulation:

- Both engineering and architectural technologists are reserved titles in some provinces. Certification is voluntary.

Key Skills unique to the Built Heritage Sector:

- Familiarity with suppliers and trade contractors with experience in built heritage projects.
- Understanding of period-specific construction technologies and materials.
- Ability to integrate building code compliance and retro-fitting or repair with the cultural and historical integrity of a built heritage structure.
- Understanding of conservation standards.
- Understanding of conservation and restoration philosophies (architectural technologists).

Associations or Administrative Bodies concerned with Professional or

Occupational Standards, Licensing or Certification:

- Certification of engineering and architectural technologists is administered by bodies recognized in statute or regulation. These bodies are independent of the respective engineering and architectural licensing bodies.
- The Canadian Technology Accreditation Board accredits college programmes in engineering.
- The Canadian Technology Human Resources Board has established a database occupational standards for various technology fields, including several civil and building engineering fields.

NOC:

- 2231 Civil Engineering Technologists and Technicians
- 2232 Mechanical Engineering Technologists and Technicians
- 2241 Electrical and Electronics Engineering Technologists and Technicians
- 2251 Architectural Technologists and Technicians
- 2253 Drafting Technologists and Technicians

Potential Issues:

- There are no occupational standards or specialized certifications for either engineering or architectural technologists who work in the built heritage sector. In light of the fact that that engineering and architectural technologists work under the direction of a professional engineer or architect, any initiative to establish certification at the technologist level would need to be undertaken in tandem with an initiative to establish certification at the professional level.

Landscape Architects

Overview of Occupation:

- Landscape architects design and manage the rehabilitation of the land taking into account landscape features, climate, expected usage, and building features.
- Heritage conservation is one of the acknowledged areas of specialization in the profession. Landscape architects working in this area undertake historical research, analyze contemporary needs, and recommend stabilization, restoration, adaptation, and interpretation of landscapes to accommodate human use and ensure protection of cultural resources.

Training and Education:

- Landscape architects hold a specialized architectural degree.

Occupational or Professional Regulation:

- Landscape architect is a reserved title or licensed profession in all provinces.
- In addition to education and experience requirements, members of the profession must pass the Landscape Architect Registration Exam which is a standard examination in North America.

Key Skills unique to the Built Heritage Sector:

- Understanding of period-specific landscape design.
- Ability to integrate landscape design with the aesthetics of a built heritage structure.
- Understanding of conservation and restoration philosophies.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Certification of landscape architects is administered by provincial bodies.

NOC:

- 2152 Landscape Architects

Potential Issues:

- There is no specialized certification for landscape architects who work in the built heritage sector.

Conservators

Overview of Occupation:

- In the built heritage sector, conservators restore and propose conservation strategies for architectural components that are part of the heritage character of a structure. Among others, these architectural components include: ceramic work, mosaics, paper, terrazzo, fabric finishes, fresco work, and decorative metal components. Conservators often specialize in particular types of conservation.
- Conservators may also undertake or direct research related to specific components of a built heritage structure.
- Conservators often document in both written and photographic form the condition of a structure and/or its components and the work carried out during its restoration or conservation.
- Conservators are employed by the public sector, heritage institutions. Many conservators also work on a self-employed basis.

Training and Education:

- Conservators may have a post-graduate degree in art conservation or have completed a college program in conservation technology.
- A large portion of the skills required are learned through experience.

Occupational or Professional Regulation:

- There is no statutorily based regulation of the conservator profession.
- However, the Canadian Association of Professional Conservators accredits members based on a review of their training, education and experience as well as the laboratory and other technical facilities to which they have access. <http://www.capc-acrp.ca>

Key Skills:

- Knowledge of conservation standards and guidelines.
- Knowledge of cultural and economic role of built heritage sector and conservation philosophies.
- Knowledge of period-specific materials and technologies.
- Technical ability to develop conservation strategies.
- Technical ability to carry out restoration work in areas of specialization and to supervise trades.
- Depending on the size of the conservation project, conservators may need to develop and administer budgets and manage projects and staff.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- The Canadian Association of Professional Conservators accredits members based on a review by a Board of Examiners. Accreditation is voluntary and currently covers only a minority of professional conservators
- There are numerous international conservation bodies. Membership standards vary by association. Most associations have a code of ethics and professional practice that members must accept.

Potential Issues:

- The current system of certification is voluntary. A mandatory system may be appropriate.

NOC:

- 5112 Conservators and Curators

Environmental and Hazardous Waste Consultants

Overview of Occupation:

- Environmental consultants perform environmental assessments as required by federal and provincial legislation.
- Environmental consultants also prepare and manage plans for environmental remediation and removal of hazardous waste when this is required, as a result of an environmental review.

Training and Education:

- Environmental consultants and hazardous waste consultants usually hold university degrees in science or engineering.

Occupational or Professional Regulation:

- In some provinces environmental reviews are covered by legislation governing the engineering profession.
- A voluntary certification is available through the Canadian Environmental Certification Approvals Board.

Key Skills unique to the Built Heritage Sector:

- Understanding of period-specific construction and land-use which may result in a residual environmental impact.
- Ability to assess environmental impact of a restored or rehabilitated built heritage structure, especially where the use of the building is altered or the building's restoration results in a significant increase in public traffic.
- Ability to devise remediation and waste removal or containment strategies that respect the architectural integrity of a heritage structure.

Associations or Administrative Bodies concerned with Professional or

Occupational Standards, Licensing or Certification:

- The licensing of professional engineers is administered at the provincial level by professional associations/ordre.
- The Canadian Environmental Certification Approvals Board is a national body offering certification to environmental practitioners. Education requirements include relevant college or university training and experience. CECAB certification is voluntary.
- Voluntary certifications are also available through the Canadian Environmental Auditing Association. However, these certifications are more relevant to persons in industries which have an ongoing environmental impact, e.g., forestry.

NOC:

- 2131 Civil Engineers (included Environmental Engineers)
- 4161 Natural and Applied Science Policy Researchers, Consultants and Program Officers (includes Environmental Consultants)

Potential Issues:

- There are no significant human resource issues distinctive to the built heritage sector.

Cost Consultants / Quantity Surveyors

Overview of Occupation:

- Cost consultants are employed on a consulting basis by owner-developers.
- Cost consultants prepare estimates of current costs for material, labour and equipment. Cost consultants also undertake life-cycle costing analysis.
- Cost consultants assist owner-developers in administering competitive tenders and selecting contractors.
- Cost consultants may also manage construction projects, in some circumstances.

Training and Education:

- Cost consultants normally are graduates of three-year college programmes in civil or construction engineering.

Occupational or Professional Regulation:

- There is no statutory regulation of this occupation.
- Voluntary, industry-recognized certifications are available through the Canadian Institute of Quantity Surveyors and its provincial affiliates.

Key Skills unique to the Built Heritage Sector:

- Familiarity with suppliers and trade contractors with experience in built heritage projects.
- Understanding of period-specific construction technologies and materials.
- Familiarity with conservation and restoration philosophies.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Voluntary, industry-recognized certifications are available through the Canadian Institute of Quantity Surveyors and its six provincial affiliates.

NOC:

- 2234 Construction Estimators

Potential Issues:

- The built heritage sector is not explicitly recognized in the syllabus of the Canadian Institute of Quantity Surveyors as a sector in which special cost factors may apply and where the use of specialized trade contractors may be necessary. The application of normal least-cost procedures may not be appropriate on a built heritage project where traditional materials and difficult to find skills are often required.

Photogrammatrists

Overview of Occupation:

- Photogrammatrists execute and interpret aerial and grade photographs of sites for mapping and surveying purposes. This work is now tied into the technology related to digitally-based geographic information systems (GIS).
- Photogrammatrists also digitally enhance photographs to assist in their interpretation.
- In the built heritage sector photogrammatrists also restore, enhance and interpret historical photographs.

Training and Education:

- Photogrammatrists normally are graduates of three-year college programmes or university geography programmes.

Occupational or Professional Regulation:

- There is no statutory regulation of this occupation, except in Quebec where there is a reserved title.
- In other provinces, photogrammatrists are eligible for a reserved title technologist certification.
- In all cases, reserved title certifications are voluntary.

Key Skills unique to the Built Heritage Sector:

- Ability to interpret aerial and grade-level photographs to identify possible evidence of prior construction.
- Ability to digitally enhance, where required, and interpret both contemporary and historical photographs for purposes of heritage site documenting.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Photogrammatrists are covered by the geomatics discipline recognized by the Canadian Council of Technicians and Technologists. (Geomatics is an allied field with limited relevance to the technical skill requirements of the built heritage sector.)
- Provincial affiliates of the CCTT administer reserved title certifications based on education and experience requirements.
- The Canadian Technology Accreditation Board accredits college programmes in geomatics. This does not include programmes or courses directly related to technical skill requirements in the built heritage sector.

NOC:

- 2255 Mapping and Related Technologists and Technicians

Potential Issues:

- There may be skill shortages in some regions of photogrammatrists with the skills specifically required by the built heritage sector.

Materials Testers

Overview of Occupation:

- Materials testers sample and test materials to determine their chemical composition and degree of degradation, where relevant. Materials testers may also arrange for materials to be x-rayed.
- Materials testers utilize a variety of destructive and non-destructive testing procedures.

Training and Education:

- Materials testers are normally graduates of three-year college programmes or university geography programmes.

Occupational or Professional Regulation:

- There is no statutory regulation of this occupation.
- Materials testers are eligible for a reserved title technologist certification.
- In all cases, reserved title certifications are voluntary.

Key Skills unique to the Built Heritage Sector:

- Understanding of period-specific construction technologies and materials.
- Familiarity with non-destructive testing procedures where relevant.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Materials testing technologists are recognized by the Canadian Council of Technicians and Technologists in various disciplines.
- Provincial affiliates of the CCTT administer reserved title certifications based on education and experience requirements.
- The Canadian Technology Accreditation Board accredits college programmes.

NOC:

- 2231 Civil Engineering Technologists and Technicians

Potential Issues:

- There are no significant human resource issues.

Interior Designers

Overview of Occupation:

- Interior designers develop interior space plans (including non load-bearing partitioning), recommend floorcovering and wall finishes, and propose furnishings and other décor.
- Interior designers may also determine the location of electrical and mechanical outlets within technical and Building Code constraints.
- In most circumstances, interior designers are sub-contracted by architects.

Training and Education:

- Interior designers are graduates of three-year college programmes or polytechnical institutes.

Occupational or Professional Regulation:

- In most provinces, interior design is a registered title. Registration is voluntary.
- In some provinces, interior designers may be required to demonstrate competence in Building Code application.

Key Skills unique to the Built Heritage Sector:

- Familiarity with suppliers and trade contractors with experience in built heritage projects.
- Understanding of period-specific finishing materials and aesthetic styles.
- Ability to integrate building code compliance with the cultural and historical integrity of a built heritage structure.
- Knowledge of conservation and restoration philosophies.

Associations or Administrative Bodies concerned with Professional or

Occupational Standards, Licensing or Certification:

- College and other programmes are certified by the US-based Foundation for Interior Design Education Research (FIDER).
- Certification is administered by provincial bodies.
- Certification is based on completion of an accredited training programme, experience, and completion of National Council for Interior Design Qualification (NCIDQ) examinations.

NOC:

- 5242 Interior Designers

Potential Issues:

- There are no occupational standards or specialized certifications for interior design practice related to built heritage work.

Bricklayers, Stonemasons, Stone Cutters

Overview of Occupation:

- The bricklayer/stonemason trade mixes mortars according to specifications, lays brick, cuts and lays stone, and restores and cleans existing masonry. Bricklayers/stonemasons use hand tools and power tools.
- In the NOA, Blocks E and F specifically describe restoration and ornamental masonry as integral to the trade.
- In addition to brick and stone, bricklayers/stonemasons also work with terracotta and exterior tiles.

Training and Education:

- Completion of an apprenticeship ranging from 4800 hours to 7200 hours. In-school training ranges from 15 weeks to 24 weeks. In-school training is delivered through colleges. In Ontario there are also industry and union-based training centres.
- Some manufacturers, such as Cathedral Stone Products provide, industry-based training in the use of specialty mortars used in restoration work.
- An inventory of training is available on the website of the Canadian Masonry Human Resources Committee: <http://www.prismeconomics.com/cmhrc/search.html>

Occupational or Professional Regulation:

- In Quebec, Nova Scotia and New Brunswick, the trade is compulsory. In all other provinces the trade is voluntary. In Newfoundland there is a separate trade designation for stonemasons.
- The trade is a Red Seal designated trade.

Key Skills unique to the Built Heritage Sector:

- Understanding of period-specific mortars and other materials.
- Ability to identify compatible materials to match existing stonework style and to lay brick and stone in a compatible style
- Ability to cut stone to match existing stonework, especially in masonry decorated arches, entrances and windows.
- Ability to clean and restore existing masonry and stonework.
- Ability to document work.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Trade certification is provincially administered. Trade standards are overseen by provincial/trade advisory committees.
- Unions:
 - International Union of Bricklayers and Allied Craftworkers
 - Brick and Allied Craft Union of Canada
 - Labourers, Local 183 (Toronto area only)
 - Quebec Federation of Labour (Quebec only)
- Unionized employers are represented by the Canadian Masonry Contractors Association and by its provincial chapters.
- The Canadian Masonry Human Resources Committee was established in 1998 representing employer and employee interests.
- The industry operates a training centre in Mississauga. Training is also delivered by some union-based training centres.
- There are also important industry certifications, particularly in the use of mortar compounds, such as Jahn Restoration Mortars (manufactured by Cathedral Stone Products).

NOC:

- 7281 Bricklayers

Potential Issues:

- There is general recognition in the industry that restoration work will take on greater importance in the future. Restoration work includes, but is not restricted to, built heritage structures.
- Blocks E and F of the NOA, which focus on restoration work are not covered in all provinces.
- If skill shortages are identified as a significant problem, a more thorough review of Blocks E and F and their adoption in provincial training standards may be appropriate.
- In light of the industry's training resources, a specialized industry-based curriculum might also be appropriate.
- Initiatives in the masonry field should be discussed with the Canadian Masonry Human Resources Committee, which would play the lead role in identifying strategies.

Stone Carvers

Overview of Occupation:

- Stone carvers repair and replicate decorative carved stone work and also carve stone from drawings.
- Stone carvers also design or work from drawings to construct stone monuments.
- Stone carvers also engrave stone.

Training and Education:

- There is no recognized trade. Training is available in some colleges and art schools.
- Some individuals may enter the craft with a background as a stone mason or tilesetter.

Occupational or Professional Regulation:

- There is no occupational regulation.

Key Skills unique to the Built Heritage Sector:

- ability to repair and replace decorative stonework in heritage structures in a manner that is compatible with the original work.
- ability to replicate the style of stonework in heritage structures for replacement and expansion in a manner that is compatible with the original aesthetic character of the building.
- ability to etch and engrave stone in a manner that is compatible with the original style of stonework in a heritage structure.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- There are several associations of craftspersons in the art stone carving. These associations do not administer any certifications.

NOC:

- 9414 Concrete Clay and Stone Forming Operators

Potential Issues:

- Many heritage buildings use decorative carved stone. This skill is a traditional craft carried on by self-employed persons and small shops.

Restoration Concrete Finishers

Overview of Occupation:

- The concrete finishing trade mixes cement and aggregates with additional additives as specified, pour, places and finishes concrete. Concrete finishers use hand tools and power tools.
- In the NOA, Block G describes repair and modification as integral to the trade.

Training and Education:

- Completion of an apprenticeship ranging from 3600 hours to 4800 hours. In-school training ranges from 4 weeks to 12 weeks.
- The trade is certifiable in 8 provinces, but apprenticeable only in 5 provinces.
- In some provinces, training is delivered through union-based training centres; in other provinces, colleges deliver training.

Occupational or Professional Regulation:

- In Quebec, the trade is compulsory. In all other provinces the trade is voluntary.
- The trade is a red seal designated trade.

Key Skills unique to the Built Heritage Sector:

- Ability to remove degraded concrete and replace and finish in a manner that is compatible with original concrete work.
- In expansion or renovation work, ability to finish new concrete such that it is compatible with original concrete work and aesthetic features of a built heritage structure.
- Ability to clean existing concrete work.

Associations or Administrative Bodies concerned with Professional or

Occupational Standards, Licensing or Certification:

- Trade certification is provincially administered. Trade standards are overseen by provincial/trade advisory committees.
- Unions:
 - Operative Plasterers and Cement Masons International Union
 - International Union of Bricklayers and Allied Craftworkers
 - Labourers International Union of North America
 - Quebec Federation of Labour (Quebec only)
- Employers are represented by various forming associations. There is no national organization of employers.

NOC:

- 7282 Concrete Finishers

Potential Issues:

- Restoration work is generally undertaken by specialized contractors. In some provinces there are associations of contractors and engineers who work in this field, e.g. Building and Concrete Restoration Association of Ontario <http://www.bcrao.com/> The Cement Association of Canada also maintains links with this segment of the industry.

Sheet Metal Workers (excl HVAC)

Overview of Occupation:

- The sheet metal trade fabricates customized sheet metal products and installs and repairs sheet metal products. To install sheet metal product, sheet metal workers use hand tools and power tools. To fabricate custom sheet metal products, sheet metal workers work from technical drawings and use hand tools, power tools, and computer aided machinery.
- Sheet metal workers typically hold various certifications from the Canada Welding Board.
- Major areas of trade work include: siding and decking, metal roofing components, architectural sheet metal, and the installation of customized conveyors. (Note: HVAC work which is also a major component of the trade is treated separately.)

Training and Education:

- Completion of an apprenticeship ranging from 5700 hours to 9000 hours. In-school training ranges from 23 weeks to 40 weeks.
- In most provinces, training is delivered through colleges. In B.C, there is a union-based training centre. Upgrade training is often delivered by union locals.

Occupational or Professional Regulation:

- The trade is compulsory in 5 provinces and voluntary in the remaining provinces.
- The trade is a red seal designated trade.

Key Skills unique to the Built Heritage Sector:

- Ability to work with copper, lead, tin and galvanized iron in sheet form as roofing, cladding and decorative materials.
- Ability to repair custom stamped decorative patterns in sheet metal and replicate such patterns.
- Ability to install or upgrade HVAC systems in a manner consistent with the aesthetics of a heritage structure.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Trade certification is provincially administered. Trade standards are overseen by provincial/trade advisory committees.
- Unions:
 - Sheet Metal Workers International Association
 - Quebec Federation of Labour (Quebec only)
- Most employers are represented by various sheet metal provincial associations.
- Some employers are general mechanical contractors who undertake HVAC work as part of their overall business, but are not otherwise focused on sheet metal work. These employers are often represented by mechanical contractors associations.
- There is national sheet metal human resource committee which identifies skill gaps in the trade.

NOC:

- 7261 Sheet Metal Workers

Potential Issues:

- Most sheet metal workers are experienced in stainless steel and galvanized iron. Although formally trained in other metals, such as copper, the use of such metals is much less common. Repair custom stamped decorative patterns (for which dies may no longer exist) is uncommon. As the industry divides between fabrication shops and installing contractors, trade skills are being bifurcated. Heritage structures, however, typically require a combination of shop and installation skills.

Ironworkers

Overview of Occupation:

- The ironworker trade weld structural steel components of a building or other civil structure (e.g., bridges), and installs and welds other steel components such as railings and grilles.
- Ironworkers also install and repair decorative ironwork.
- Ironworkers typically hold various certifications from the Canada Welding Board.

Training and Education:

- Completion of an apprenticeship ranging from 4000 hours to 8000 hours. In-school training ranges from 10 weeks to 25 weeks.
- In most provinces, training is delivered through colleges. Upgrade training, and in some instances, apprenticeship; training, is delivered by union locals.
- The trade is certifiable in all provinces, but apprenticeship is only in 8 provinces.

Occupational or Professional Regulation:

- The trade is voluntary in all provinces, except Quebec and Alberta where it is compulsory.
- The trade is a red seal designated trade.

Key Skills unique to the Built Heritage Sector:

- Ability to install, repair and replicate decorative ironwork and decorated rails and grilles in a manner that does not draw attention to repaired or replicated work.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Trade certification is provincially administered. Trade standards are overseen by provincial/trade advisory committees.
- Unions:
 - International Association of Bridge, Structural, Ornamental and Reinforcing Ironworkers
 - Quebec Federation of Labour (Quebec only)

NOC:

- 7264 Ironworkers

Potential Issues:

- Many heritage structures utilized extensive decorative ironwork in grilles and railings. The ability to repair and replicate this work in an appropriate way can be key to preserving the aesthetic integrity of many heritage structures.

Finish (or Trim) Carpenters / Framers

Overview of Occupation:

- The carpentry trade is diverse. In some provinces there is only one recognized trade. In other provinces, separate trades have been established, chiefly oriented to residential construction. In larger markets, the industry is segmented by areas of specialization, e.g., formwork, framing, window and door installation, finish carpentry, etc.
- Finish (or Trim) carpenters cut custom millwork, and install custom and pre-fabricated millwork, and stain and finish millwork.
- Framers construct footings, install beams and joists, trusses and other structural members of low-rise buildings.

Training and Education:

- Completion of an apprenticeship ranging from 6000 hours to 8000 hours. In-school training ranges from 20 weeks to 32 weeks.
- In all provinces, training is delivered through colleges. Upgrade training, and in some instances, apprenticeship; training, is delivered by union locals.
- The trade is apprenticeship in all provinces.

Occupational or Professional Regulation:

- The trade is voluntary in all provinces, except Quebec.
- The trade is a red seal designated trade.

Key Skills unique to the Built Heritage Sector:

- Finish (or Trim) Carpenters:
 - ability to repair or replicate millwork in heritage buildings,
 - ability to clean and refinish existing millwork and finish new millwork to match existing millwork,
 - knowledge of traditional stains and finishes.
- Framers:
 - ability to examine structural members for degradation or weakness,
 - ability to remove and replace weakened or inadequate structural members,
 - ability to install modern structural supports without detracting from aesthetic integrity of a built heritage structure.
- In some types of built heritage structures traditional construction methods may be required. These relate chiefly to methods of securing and fastening joinery.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Trade certification is provincially administered. Trade standards are overseen by provincial/trade advisory committees.
- Unions:
 - International Brotherhood of Carpenters and Joiners
 - Quebec Federation of Labour (Quebec only)
- A national human resource committee has been established.

NOC:

- 7271 Carpenters

Potential Issues:

- Restoration of heritage work is not identified as a specific skill block in the NOA. However, the NOA does address installation of all types of wooden construction, including architectural woodwork.

Marble, Tile and Terrazzo Workers

Overview of Occupation:

- The marble tile and terrazzo trade covers the interior and exterior cutting, installation, polishing and repair of marble work, ceramics, quarry tile (e.g., slate) and terrazzo. The trade does not cover the manufacture of ceramic tiles.

Training and Education:

- Completion of an apprenticeship ranging from 4860 hours to 6000 hours. In-school training ranges from 12 weeks to 16 weeks.
- In all provinces, training is delivered through colleges. Upgrade training, and in some instances, apprenticeship; training, is delivered by union locals.
- The trade is apprenticeshipable in all provinces.

Occupational or Professional Regulation:

- The trade is certifiable, but voluntary in 5 provinces and compulsory in Quebec. The trade is apprenticeshipable in only 4 provinces. (The trade is not recognized in Ontario.)
- The trade is a red seal designated trade.

Key Skills unique to the Built Heritage Sector:

- ability to clean, repair and re-install broken tiles,
- ability to re-polish installed marble and terrazzo.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Trade certification is provincially administered. Trade standards are overseen by provincial/trade advisory committees.
- Unions:
 - International Union of Bricklayers and Allied Craftworkers
 - Operative Plasterers' and Cement Masons' International Association (terrazzo only)
 - Brick and Allied Craft Union of Canada
 - Labourers, Local 183 (Toronto area only)
 - Quebec Federation of Labour (Quebec only)
- Employer organizations operate at the provincial level.

NOC:

- 7283 Tilesetters

Potential Issues:

- The most significant human resource issue is the limited coverage of the trade, especially its non-recognition in Ontario. In the absence of a certified trade, skills are acquired through ad hoc experience. The nature of the market is such that ceramic tilesetting skills will be generally available, but more specialized skills, such as marble, terrazzo and quarry tile working skills may be in short supply.

Glaziers

Overview of Occupation:

- The glazier trade cuts, installs and replaces glass and mirrors.
- Glaziers also tint glass and create patterns by etching or sandblasting.
- Glaziers use hand tools, power tools, and computer-aided cutting tools.

Training and Education:

- Completion of an apprenticeship ranging from 6000 hours to 8000 hours. In-school training ranges from 18 weeks to 24 weeks.
- In all provinces, training is delivered through colleges. Upgrade training, and in some instances, apprenticeship; training, is delivered by union locals.
- The trade is apprenticeable in all provinces, except in Atlantic Canada where the trade is certifiable, but not apprenticeable.

Occupational or Professional Regulation:

- The trade is voluntary in all provinces, except Quebec where it is compulsory.
- The trade is not apprenticeable in Atlantic Canada
- The trade is a red seal designated trade.

Key Skills unique to the Built Heritage Sector:

- ability to replace glass in heritage structures using glass that is compatible in its type and styling with the original glass work.
- ability to upgrade glass in modernized heritage structures using materials that are compatible with the original aesthetic character of the building.
- etching skills are of particular importance.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Trade certification is provincially administered. Trade standards are overseen by provincial/trade advisory committees.
- Unions:
 - International Union of Painters and Allied Trades)
 - Quebec Federation of Labour (Quebec only)
- Employer organizations operate at the provincial level.

NOC:

- 7292 Glaziers

Potential Issues:

- Many heritage buildings use decorative etching. This skill is less in demand for new construction (etching being done at the factory) and may be in short supply in some regions.

Leaded Glass Workers / Restorers

Overview of Occupation:

- Leaded glass workers build and repair stained and leaded glass.

Training and Education:

There is no recognized trade. Training is available in some colleges and art schools.

Occupational or Professional Regulation:

There is no recognized trade.

Key Skills unique to the Built Heritage Sector:

- ability to repair and replace stained and leaded glass in heritage structures in a manner that is compatible with the original glass work.
- ability to replicate the style of stained and leaded glass in heritage structures for replacement and expansion in a manner that is compatible with the original aesthetic character of the building.
- ability to etch glass in a manner that is compatible with the original style of glass work in a heritage structure.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- There are several associations of craftspersons in the art glass sector. These associations do not administer any certifications.

NOC:

- 7292 Glaziers

Potential Issues:

- Many heritage buildings use stained and leaded glass. This skill is a traditional craft carried on by self-employed persons and small shops.

Roofers

Overview of Occupation:

- The roofing install new and replacement roofing systems on flat roofs, and shingles, shakes and roofing tiles on sloped roofs.
- In most regions the trade is segmented between flat roofing system installers and shinglers.

Training and Education:

- Completion of an apprenticeship ranging from 3600 hours to 5400 hours. In-school training ranges from 12 weeks to 24 weeks.
- In all provinces, training is delivered through colleges.
- The trade is certifiable in all provinces.
- The trade is apprenticeable in 8 provinces.
- The Canadian Roofing Contractors Associations publishes the Canadian Roofing Reference Manual which provides the basis for training standards.

Occupational or Professional Regulation:

- The trade is voluntary in all provinces, except Quebec where it is compulsory.

Key Skills unique to the Built Heritage Sector:

- Ability to repair and install slate roofing systems,
- Ability to repair and install traditional shakes, shingles and tiles.
- Ability to install flat roofing systems in building modernizations.
- Note: metal roofing systems are covered by the sheet metal trade.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Trade certification is provincially administered. Trade standards are overseen by provincial/trade advisory committees.
- Unions (chiefly flat roofing systems):
 - Sheet Metal Workers International Association
 - Quebec Federation of Labour (Quebec only)
- Unions (chiefly shingling)
 - International Brotherhood of Carpenters and Joiners (shinglers)
 - Labourers International Union of North America (shinglers)
 - Quebec Federation of Labour (Quebec only)
- The Canadian Roofing Contractors Associations represents employers, chiefly in the flat roofing segment of the market.

NOC:

- 7291 Roofers

Potential Issues:

- Many heritage buildings use slate roofing systems. Skill availability may be an issue in some regions.

Painters and Decorators

Overview of Occupation:

- Painters and decorators clean and prepare surfaces and apply paint, wallpaper, fabric, stucco, and other finishes to interior and exterior surfaces.
- Painters and decorators also apply waterproofing and fire retardant finishes as required.
- Painters and decorators use hand tools and spray equipment.

Training and Education:

- Completion of an apprenticeship ranging from 4620 hours to 7200 hours. In-school training ranges from 15 weeks to 24 weeks.
- In all provinces, training is delivered through colleges.
- The trade is certifiable in all provinces.
- The trade is apprenticeable in all provinces, except PEI.

Occupational or Professional Regulation:

- The trade is voluntary in all provinces, except Quebec, where it is compulsory.

Key Skills unique to the Built Heritage Sector:

- Ability to clean and repair or touch-up existing surface work.
- Ability to apply new surface materials in a manner consistent with existing surface work.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Trade certification is provincially administered. Trade standards are overseen by provincial/trade advisory committees.
- Unions (chiefly flat roofing systems):
 - International Union of Painters and Allied Trades
 - Quebec Federation of Labour (Quebec only)
- Employers are organized at the provincial level.

NOC:

- 7294 Painters and Decorators

Potential Issues:

- Many heritage buildings used lead-based paints which are no longer permitted. Substitute are normally required.

Plasterers

Overview of Occupation:

- Plasterers remove degraded plaster and apply new plaster coats to lathe.
- Plasterers remove degraded stucco apply new stucco to mesh.
- Plasterers may apply decorative finishes to plaster.
- Plasterers also may apply specialty finish products that have a cementitious base.
- Plasterers install, and in some cases fabricate from a mould, decorative plaster items.

Training and Education:

- Completion of an apprenticeship ranging from 4800 hours to 5400 hours. In-school training ranges from 0 to 20 weeks.
- In all provinces, training is delivered through colleges. In some regions, training is delivered through industry-based training centres.
- The trade is apprenticeable and certifiable in Quebec, Ontario, Saskatchewan and B.C.

Occupational or Professional Regulation:

- Where the trade is certified, it is voluntary, except Quebec, where it is compulsory.

Key Skills unique to the Built Heritage Sector:

- Ability to clean and repair or touch-up existing surface work.
- Ability to apply new surface materials in a manner consistent with existing surface work.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Trade certification is provincially administered. Trade standards are overseen by provincial/trade advisory committees.
- Unions:
 - International Union of Painters and Allied Trades
 - International Union of Plasterers and Cement Masons
 - Quebec Federation of Labour (Quebec only)
 - Operative Plasterers' and Cement Masons' International Association
- Employers are organized at the provincial level.

NOC:

- 7284 Plasterers, Drywall Installers and Finishers and Lathers

Potential Issues:

- The predominant demand in the market place is for drywall tapers. Except in Quebec, only a minority of apprentices completed their training, after acquiring taping skills. In provinces where plasterers are not a certified trade, skill shortages are likely to be even more marked, especially in the application of decorative or specialty finishes.

Lathers

Overview of Occupation:

- Lathers repair and install non-load-bearing partitions and lathe.
- In the contemporary market place, lathers are chiefly engaged in the installation of interior partitions and drywall.

Training and Education:

- Completion of an apprenticeship ranging from 5400 hours to 6000 hours. In-school training ranges from 20 to 22 weeks.
- In all provinces, training is delivered through colleges. In some regions, training is delivered through industry-based training centres.
- The trade is certifiable in all provinces, and apprenticeable in all provinces except in Atlantic Canada.

Occupational or Professional Regulation:

- Where the trade is certified, it is voluntary, except Quebec, where it is compulsory.
- The trade is a designated red seal trade.

Key Skills unique to the Built Heritage Sector:

- Ability to repair and replace lathe prior to plastering.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Trade certification is provincially administered. Trade standards are overseen by provincial/trade advisory committees.
- Unions:
 - International Union of Painters and Allied Trades
 - United Brother of Carpenters and Joiners
 - Quebec Federation of Labour (Quebec only)
- Employers are organized at the provincial level.

NOC:

- 7284 Plasterers, Drywall Installers and Finishers and Lathers

Potential Issues:

- The predominant demand in the market place is for drywall installation which requires no lathe. Lathing skills are formally covered by apprenticeship training, but may be in short supply in some regions.

Plumbers, Pipefitters, Sprinkler Fitters

Overview of Occupation:

- Plumbers install, test and repair plumbing and hot water heating systems. Pipefitters install and repair high pressure systems and hydraulic systems. Sprinkler fitters install automatic sprinkling systems to suppress or contain fires, as required by most Building Codes for many types of structures.
- Plumbers and pipefitters typically hold various certifications from the Canada Welding Board.

Training and Education:

- Completion of an apprenticeship ranging from 6400 hours to 9000 hours. In-school training ranges from 23 weeks to 40 weeks.
- In most provinces, training is delivered through colleges. In some provinces, union training centres also deliver apprentice training. Upgrade training is usually delivered by union locals.

Occupational or Professional Regulation:

- The trades are compulsory in all provinces, except Newfoundland, Manitoba and BC. BC requires certification for certain tasks
- The trades are red seal designated.

Key Skills unique to the Built Heritage Sector:

- Ability to work with various types of piping, including copper, plastic, galvanized iron and lead.
- Ability to replace and repair traditional plumbing fixtures which are part of the aesthetic character of a heritage structure.
- Ability to minimize disruption or damage to decorative, visible portion of plumbing systems in heritage structures when modernizing these systems to meet Building Code requirements.

Associations or Administrative Bodies concerned with Professional or

Occupational Standards, Licensing or Certification:

- Trade certification is provincially administered. Trade standards are overseen by provincial/trade advisory committees.
- Unions:
 - United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada (UA)
 - Quebec Federation of Labour (Quebec only)
- Most employers are represented by mechanical contractors associations.
- There is national pipe trades human resource committee which identifies skill gaps in the trade.

NOC:

- 7251 Plumbers
- 7252 Steamfitters, Pipefitters and Sprinkler System Installers

Potential Issues:

- While all plumbers are trained to install and repair plumbing and hot water heating systems to Building Code standards, many plumbers may not be skilled in repair of traditional plumbing fixtures which are part of the aesthetic character of a heritage structure. Many plumbers may also not be trained in upgrading plumbing systems while preserving the decorative, visible portion of these systems in heritage structures.

Electricians

Overview of Occupation:

- Electricians install, test and repair wiring systems and electrical controls, connect wiring systems to major mechanical systems, and connect wiring systems to distribution grids.

Training and Education:

- Completion of an apprenticeship ranging from 6960 hours to 9000 hours. In-school training ranges from 24 weeks to 40 weeks.
- In all provinces, training is delivered through colleges. In some provinces, union training centres also deliver apprentice training. Upgrade training is usually delivered by union locals.

Occupational or Professional Regulation:

- The trade is compulsory in all provinces, except Newfoundland and BC. BC requires certification for certain tasks
- The trades are red seal designated.

Key Skills unique to the Built Heritage Sector:

- Ability to test, repair and upgrade wiring systems in the absence of drawings.
- Ability to install wiring systems in structures that lacked electrical service in a manner that does not detract from the original character of the structure.
- Ability to minimize disruption or damage to visible portion of heritage structures when modernizing these systems to meet Building Code requirements.

Associations or Administrative Bodies concerned with Professional or

Occupational Standards, Licensing or Certification:

- Trade certification is provincially administered. Trade standards are overseen by provincial/trade advisory committees.
- Unions:
 - International Brotherhood of Electrical Workers
 - Quebec Federation of Labour (Quebec only)
- Most employers are represented by electrical contractors associations.

NOC:

- 7241 Electricians

Potential Issues:

- While all electricians are trained to test, install and repair modern electrical systems according to Building Code standards, some electricians may not be familiar with earlier wiring systems.

HVAC

Overview of Occupation:

- Note: see earlier description for Sheet Metal Workers.
- HVAC installation is typically undertaken by sheet metal workers. In some jurisdictions, HVAC is also undertaken by refrigeration and air conditioning mechanics.
- HVAC installation involves custom fitting of ventilation and air movement systems using sheet metal products and connecting these distribution systems to mechanical sources. In larger structures, HVAC installers also test and balance air movement and install controlling devices.
- HVAC installers may hold certifications from the Canada Welding Board.

Training and Education:

- For sheet metal workers: completion of an apprenticeship ranging from 5700 hours to 9000 hours. In-school training ranges from 23 weeks to 40 weeks.
- For refrigeration and air conditioning mechanics: completion of an apprenticeship ranging from 7200 hours to 9000 hours. In-school training ranges from 20 weeks to 32 weeks.
- In most provinces, training is delivered through colleges. In B.C, there is a union-based training centre. Upgrade training is often delivered by union locals.

Occupational or Professional Regulation:

- Both trades are compulsory in 5 provinces and voluntary in the remaining provinces.
- Both trades are red seal designated.

Key Skills unique to the Built Heritage Sector:

- Ability to install or upgrade HVAC systems in a manner consistent with the aesthetics of a heritage structure.

Associations or Administrative Bodies concerned with Professional or

Occupational Standards, Licensing or Certification:

- Trade certification is provincially administered. Trade standards are overseen by provincial/trade advisory committees.
- Unions:
 - Sheet Metal Workers International Association
 - United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada (UA)
 - Quebec Federation of Labour (Quebec only)
- Sheet metal employers are represented by various sheet metal provincial associations. Specialized HVAC contractors may be represented by sheet metal employer associations or by mechanical contractors associations.
- There is national sheet metal human resource committee which identifies skill gaps in the trade.

NOC:

- 7261 Sheet Metal Workers
- 7313 Refrigeration and Air Conditioning Mechanic

Potential Issues:

- There is no specialized training related to installing HVAC systems in heritage structures that are being modernized for contemporary uses.

Project Managers

Overview of Occupation:

- Project management is undertaken by general contractors, architects, engineers, cost consultants/quantity surveyors and also by persons who are specialized in project management.
- Project managers plan the implementation of construction projects, administer tenders and contracts for sub-trades and suppliers, co-ordinate the work of sub-trades and the delivery of supplies and materials, monitor completion times, administer budgets, and deal with implementation problems.

Training and Education:

- In addition to other types of professional training, project managers may also hold certifications from the Project Management Institute. PMI recognized courses are available privately and through various professional development programs at universities and colleges.

Occupational or Professional Regulation:

- There is no statutory regulation of this occupation.

Key Skills unique to the Built Heritage Sector:

- Familiarity with suppliers and trade contractors with experience in built heritage projects.
- Understanding of period-specific construction technologies and materials.
- Familiarity with conservation and restoration philosophies.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Project Management Institute certification is common for project managers on major projects.

NOC:

- 0711 Construction Managers

Potential Issues:

- Project management is a key role in implementing a restoration, modernization, or expansion project in which preservation of the original heritage character of a structure is important. However, the built heritage sector is not explicitly recognized in any of the training of the Project Management Institute, nor in the project management training that may be acquired as part of training in one of the relevant professions or occupations.

Contractors

Overview of Occupation:

- The construction industry is divided between general contractors who bid on a complete project and trade contractors who bid as sub-contractors to undertake specific trade work. General contractors may undertake some work directly, or may sub-contract all work and function solely as project managers.
- In traditionally managed projects, owner/ developers retain architects and engineers to design a building, restoration, renovation or expansion and then tender to general contractors for constructing per the specifications. In design-build arrangements, a general contractor proposes a building and bids, based on that building. Design-build is common in mid-sized new construction. Design-build is not common in the built heritage structure.
- Smaller trade contractors may also work on sites.
- Contractors estimate the cost of jobs in terms of time, materials and overheads, and plan and execute work.
- Contractors must be familiar with the applicable building code and are liable for compliance with code requirements.
- In the low-rise residential sector, developers (usually called builders) play the role of general contractors.
- In the low-rise renovation sector, renovation contractors generally provide all construction skills directly, except for licensed electrical and mechanical trade work, which is usually sub-contracted.

Training and Education:

- Depending on the size of their firm and their trade, contractors may have a trade qualification, a master trade qualification (where it is available), engineering training, or other business training.
- The Canadian Construction Association administers the “Gold Seal” certification Program. The Gold Seal Certification Program is a national certification program for construction Project Managers, Superintendents and Estimators. To date, there have been more than 5,500 certificates issued under the Gold Seal Program.

Occupational or Professional Regulation:

- In Quebec, all contractors must be licensed by the Régie du bâtiments. In other provinces, licensing may apply at the municipal level, but typically only applies to the electrical and mechanical trades where a “master” certification may be required.

Key Skills unique to the Built Heritage Sector:

- Familiarity with suppliers and (for general contractors) trade contractors with experience in built heritage projects.
- Understanding of period-specific construction technologies and materials.
- Ability to integrate building code compliance and retro-fitting or repair with the cultural and historical integrity of a built heritage structure.
- Understanding of conservation and restoration objectives.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Canadian Construction Association
- Canadian Home Builders Association (and its provincial affiliates)

NOC:

- 721 Contractors and Supervisors, Trades and Related Work

Potential Issues:

- Consideration could be given to developing an optional module for certification under CCA’s Gold Seal Program.

Heritage Site Facility Managers

Overview of Occupation:

- Facility managers plan and oversee preventive maintenance and arrange for needed repairs to buildings and sites. Regular inspections are integral to this work.
- Facility managers ensure the provision of utilities, cleaning services and other routine services.
- Facility managers oversee landscape maintenance and plan landscape maintenance schedules.
- Facility managers develop and administer annual budgets and develop recommendations on major capital expenditures.
- Facility managers oversee maintenance staff and manage contracted services.
- Facility managers plan inspections and tests of materials, etc. to ensure their conservation.
- In some sites, facility managers must manage parking and other tourist related amenities and facilities.

Training and Education:

- Generic training in real property management is available through community colleges.
- The Building Owners and Managers Institute of Canada administers training programs and certifications. Courses are available on a self-study basis and on a classroom basis in 9 cities. Completion of training normally takes 2-3 years.
- BOMA training is oriented to commercial properties. There is no specialized training in managing heritage buildings. However, some chapters of BOMA do recognize excellence in heritage property redevelopment through awards.
- Depending on the size of the heritage site, training in civil or mechanical engineering at the college or university level may be required.

Occupational or Professional Regulation:

- There is no statutory regulation of this occupation.
- Key Skills unique to the Built Heritage Sector:
- Ability to develop and administer preventive maintenance plans and related budgets and prepare relevant financial analysis information
- Ability to interpret and respond to engineering studies and materials test results.
- Ability to develop and administer capital spending plans up to appropriate levels.(Field work will provide guidance on amount and nature.)
- Ability to hire and manage staff.
- Familiarity with suppliers and trade contractors with experience in built heritage projects.
- Understanding of period-specific construction technologies and materials .
- Understanding of conservation and restoration objectives.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- Building Owners and Managers Association of Canada

NOC:

- 0721 Facility Operation and Maintenance Managers

Potential Issues:

- Implicit in this occupational description is a distinction between facility management and program management. In smaller heritage sites, these two functions may be combined. In larger sites, real property management and facility management may be separate functions.
- Some private and public organizations may not distinguish between management of heritage sites and management of ordinary real property assets.

Heritage Site Program Managers

Overview of Occupation:

- Heritage site managers plan and oversee programs, guided tours, and the production of audio-visual and printed interpretive materials.
- Heritage site managers also develop and oversee or manage volunteer programs.
- In smaller heritage sites, program managers may also perform curatorial functions.
- In larger sites, program managers may develop and manage outreach programmes to schools and communities.
- In some instance, seeking external funding may be a component of the jobs.

Training and Education:

- Some universities and colleges/CEGEPs offer courses or programs in cultural or heritage resource management.
- Some MBA programs offer an option for specialization in cultural industries.

Occupational or Professional Regulation:

- There is no statutory regulation of this occupation.

Key Skills unique to the Built Heritage Sector:

- Ability to develop or manage development of interpretive programs and materials.
- Ability to develop and administer outreach programs.
- Ability to develop and administer budgets and funding proposals.
- Ability to lead and support committees.
- Ability to lead and support volunteers.
- Ability to hire and manage staff.
- Knowledge of conservation and restoration objectives.
- In depth understanding of cultural and economic role of built heritage sector and conservation philosophies.
- At senior levels, ability to develop strategic plans.

Associations or Administrative Bodies concerned with Professional or

Occupational Standards, Licensing or Certification:

- There are several professional associations, but none that are directly involved in developing and administering occupational standards and related certifications.

NOC:

- 0511 Library, Archive, Museum and Art Gallery Managers

Potential Issues:

- There are no generally recognized occupational standards.

Guides

Overview of Occupation:

- Guides describe various aspects of a heritage site, explaining the historical and/or aesthetic background and significance of the site. Guides also answer questions and may assist in facilitating tours.

Training and Education:

- Some colleges may provide formal training in guide skills.
- Guide training is normally undertaken at the heritage site.
- General educational training in the historical or cultural themes represented by the heritage site.

Occupational or Professional Regulation:

- There is no statutory regulation of this occupation.

Key Skills unique to the Built Heritage Sector:

- Understanding of the historical and/or aesthetic background of a heritage site and the larger historical or cultural context of the site.
- Ability to present information verbally, operate audio-visual aids, and respond to questions.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- There are no occupational associations.
- In some cases, guides may be represented by a union.

NOC:

- 6441 Tour and Travel Guides

Potential Issues:

- There are no significant human resource issues.

Marketing Managers

Overview of Occupation:

- Marketing managers design, budget and execute marketing strategies. Among other channels, this may include: web site design, design or promotional literature, design of radio and television commercials, design or posters and other promotional material. Marketing managers may also design memorabilia for retail sale.
- Marketing managers may also plan promotional events related to a heritage site.

Training and Education:

- Marketing training is taught at the university and college level. Some courses may focus on tourist related marketing.

Occupational or Professional Regulation:

- There is no statutory regulation of this occupation.

Key Skills unique to the Built Heritage Sector:

- Understanding of tourist industry and the promotion of heritage sites.
- Ability to identify target audiences relevant to built heritage sector.

Associations or Administrative Bodies concerned with Professional or Occupational Standards, Licensing or Certification:

- The Canadian Marketing Association administers industry-recognized certifications.

NOC:

- 4163 Business Development Officers and Marketing Researchers and Consultants

Potential Issues:

- Marketing is usually undertaken by marketing consultancies, although some functions may be performed in-house by larger organizations.
- There are no significant human resource issues.



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