



General Elective Course >> Masonry Conservation

Date: May 8, 2010, 9:00 am – 3:00 pm

Location: Mission to Seafarers Building, 401 East Waterfront Road, (just east of Gastown) Vancouver

Instructors: Dwayne Friesen, Certified Brick Specialist, I-XL Industries Ltd.; Leslie B. B. Peer, Ph.D., P.Eng., BEP, LEED AP, Principal, Read Jones Christoffersen Ltd.; Bill McEwen, P.Eng. LEED AP, Executive Director, Masonry Institute of British Columbia; JP LeBerg, CTR, Technical and Training Services, Masonry Institute of British Columbia

Overview of the Course

Many older buildings in British Columbia have components made of brick, stone, and concrete blocks. Over time, these masonry elements—chimneys, foundations and walls—show signs of age and require conservation measures in order to extend their useful life. This course provides an overview on minimal intervention during the process of conserving masonry building elements.

A special feature of this course will be a “hands-on” session which will enable everyone to participate in the construction of a small brick wall in order to gain a feel for this building material and its design in both an historic and contemporary context. This course will be of specific interest to building contractors, renovators, planners, architects, engineers, building technologists, interior designers, building managers and inspectors, realtors, local government staff, and property owners. Continuing education credits are available from the AIBC, PIBC, BCSLA and AIC-BC.

Learning Objectives

The objectives of the course are to:

- familiarize participants with masonry building materials and construction techniques focusing on brick, stone and concrete blocks used in older buildings in Western Canada
- examine and discuss signs of deterioration on different types of masonry
- consider options for the conservation and repair of brick, stone and concrete building components
- discuss conservation measures which are both “recommended” and “not recommended” in the publication, *Standards and Guidelines for the Conservation of Historic Places in Canada*
- engage course participants in a hands-on exercise to build a small section of a brick wall to experience working with brick as a building material



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Course Outline

9:00 – 9:05 am **Welcome and Introductions**

9:05 – 10:00 am **Session One: Masonry in Western Canadian Buildings**

An historical overview of masonry as a building material:

- historical use of brick and local stone in the Greater Vancouver area
- design features during the 19th and 20th centuries
- historical design trends and construction techniques
- manufacture of brick: historically and today in Western Canada
- current masonry production and availability of reproduction masonry
- the importance of considering the manufacturing process in selecting buildings materials
- clay brick identification—manufacturer; time period; soft mud; pressed; stiff mud
- colour/size/ texture matching

9:50 – 10:30 am **Session Two: What types of masonry elements need to be conserved, repaired, consolidated and/or replaced?**

Types of structural loading:

- construction techniques—walls, foundations and paving
- load bearing vs. decorative veneer
- structural components and their strength
- what to look for on building exteriors and interiors

Reading a building:

- changes to the structure over time
- moisture penetration
- signs of deterioration and the significance of a building's patina
- tips and clues about the building which help to guide future conservation work

Considerations for masonry building components (brick, stone and concrete blocks):

- seismic considerations--gravity and the strength of masonry components

Working with the regulations:

- building code requirements: Parts 9, 4 and 5 of the National Building Code
- building standards
- *Standards and Guidelines for the Conservation of Historic Places in Canada*

10:30 – 10:45 am **Break and walkabout** to explore the condition of the masonry components at the Mission to Seafarer's Building

10:45 am – 11:45 **Session Three: Extending the Life of Masonry Building Elements--Brick, Stone + Concrete Blocks**

Dealing with deteriorated masonry: visual signs, broad causes and rehabilitation strategies:

- expansion
- freeze-thaw damage
- settling
- earlier repairs
- biological growth
- efflorescence

Mortars:

- properties—design and composition of the mortar
- lime mortar in a coastal climate
- composition of the sands
- deterioration

Philosophic introduction to authentic restoration techniques--maintaining the value of the building fabric:

- authentic restoration vs. quick fix solutions:
- repointing—tools and techniques
- aesthetics; historical accuracy
- curing
- strength
- maintenance

11:45 pm - 12:00 pm Questions and Discussion

12:00 pm - 12:15 pm Lunch

12:15 pm – 1:45 pm Session Four: Cleaning and Conserving Masonry

- this session will include highlights from the *Standards and Guidelines for the Conservation of Historic Places in Canada* as a framework to guide the conservation of brick and stone chimneys; masonry foundations as well as stone walls common to older buildings in Greater Vancouver
- a central question will be how to balance conservation measures and the building's patina with the natural aging process
- methods of cleaning—treatments which are recommended vs. not recommended
- stripping paint from masonry surfaces
- cleaning and sealing masonry as a part of maintenance: to seal or not to seal?
- damaging cleaning techniques and their avoidance
- sustainability: insulating masonry buildings and the re-use of masonry fabric
- chimneys: old and new; energy efficiency—wood and gas burning; restoration, inserts and lining
- who should undertake the conservation work—building your team of experts
- routine maintenance and future considerations including budgets, skilled contractors and sourcing materials
- procuring supplies for conservation work
- local sources

1:45 – 2:45 pm Session Five: Hands-on Exercise – Building a small brick wall

- course participants will be divided into small groups in order to build a small section of a brick wall in the parking lot of the Mission to Seafarers
- participants will learn about brick as a building material; the construction of a load-bearing wall vs. a decorative veneer; pointing and repair techniques

2:45 – 3:00 pm Concluding Discussion and Course Evaluations

Selected References on Masonry Conservation: (* = circulated electronically prior to the course)

Brick Institute of America. "Cleaning Brick Masonry." Technical Notes on Brick Construction (No. 20) rev., November, 1990.

*Chodikoff, Ian. "Brick-Makers: A Local Brick Manufacturer in Medicine Hat Holds on to Traditional Values Affecting Both its Community as Well as the Craft of Making Bricks", *Canadian Architect*, September 2006.

Collier, Richard. *Guidelines for Restoring Brick Masonry*. Technical Paper Series No. 2. Victoria: British Columbia Heritage Trust, 1981.

Grimmer, Anne E. *A Glossary of Historic Masonry Deterioration Problems and Preservation Treatments*. Washington, D.C.: U.S. Dept. of the Interior, National Park Service, Preservation Assistance Division, Technical Preservation Services, 1984.

Grimmer, Anne E. *Keeping it Clean: Removing Exterior Dirt, Paint, Stains and Graffiti from Historic Masonry Buildings*. Washington, D.C.: U.S. Dept. of the Interior, National Park Service, Preservation Assistance Division, Technical Preservation Services, 1988.

Fielden, Bernard, M. *Conservation of Historic Buildings*. London: Butterworth Scientific, 1982.

Fram, Mark. *Well-Preserved: the Ontario Heritage Foundation's Manual of Principles and Practice for Architectural Conservation*. Erin, Ont.: The Boston Mills Press for the Ontario Heritage Foundation, third revised edition, 2003. ISBN 550463861.

LeBold, Diane and Ken Fisher, Jr. "Repointing Stonework." *The Old-House Journal*, July/August 1991, pp. 38-41.

London, Mark. *How To Care for Old and Historic Brick and Stone*. Washington, D.C.: The Preservation Press, 1988.

London, Mark and Dinu Bumbaru. *Traditional Masonry*. Technical Guide no. 3. Montreal: Héritage Montréal and Quebec Ministry of Cultural Affairs, 1986.

*Mack, Robert, C. and Anne Grimmer. *Assessing Cleaning and Water-Repellent Treatments for Historic Masonry Buildings*. Preservation Brief No. 1. Rev. ed. Washington, D.C.: National Park Service, Heritage Preservation Services Division, Technical Preservation Services, 2000.

*Mack, Robert C. and John P. Speweik. *Repointing Mortar Joints in Historic Masonry Buildings*. Preservation Brief No. 2. Rev. ed. Washington, D.C.: National Park Service, Heritage Preservation Services Division, Technical Preservation Services, 1998.

*Maurenbrecher, A. H. P. and K. Trischuk, M.Z. Rousseau and M.I. Subercaseaux. "Repointing Mortars for Older Buildings—Design Considerations. Construction Technology Update No. 67, Ottawa: National Research Council of Canada, March 2008, 6 pp.

*Maurenbrecher, A. H. P. and K. Trischuk, M.Z. Rousseau and M.I. Subercaseaux. "Repointing Mortars for Older Buildings—Site Considerations. Construction Technology Update No. 68, Ottawa: National Research Council of Canada, March 2008, 6 pp.

Maurenbrecher, A. H. P. and K. Trischuk, M.Z. Rousseau and M.I. Subercaseaux. "Key Considerations for Repointing Mortars for Conservation of Older Masonry. Research Report No. 225, Ottawa:

Institute for Research in Construction, National Research Council of Canada, January 2007.
<http://irc.nrc-cnrc.gc.ca/pubs/rr/rr225/index.php?lang=e>

Pearson, Larry. *Repointing Historic Masonry*. Heritage Notes no. 5. Edmonton: Alberta Historical Resources Foundation and Alberta Community Development (formerly Alberta Culture and Multiculturalism), 1992.

"Repointing, An Annotated Master Specification for the Repointing of Historic Masonry." Technical Notes 5, *Communique*, Vol. XIV (2). Prepared for the Association of Preservation Technology by the Heritage Branch of the Ontario Ministry of Citizenship and Culture, 1982.

Respectful Rehabilitation: Answers to Your Questions about Old Buildings. Washington, D.C.: Preservation Press and Technical Preservation Services, National Park Service, U.S. Department of the Interior, 1982. ISBN 0891331034.

Weaver, Martin E., with F. G. Matero. *Conserving Buildings: Guide to Techniques and Materials*. New York: John Wiley & Sons, Inc., 1993.

*Weaver, Martin E. *Removing Graffiti from Historic Masonry*. Preservation Brief No. 38. Washington, D.C.: National Park Service, Heritage Preservation Services Division, Technical Preservation Services, 1995.

Selected Web Resources:

- **Canada Masonry Design Centre**
www.canadamasonrycentre.com/cmdc/links.asp
- **Masonry Conservation Research Group Publications**
<http://www2.rgu.ac.uk/schools/mcrg/publicn.htm>
- **Masonry Institute of America**
www.masonryinstitute.org/industry_sites.htm
- **Masonry Institute of British Columbia**
www.masonry.bc.org/home
- **Masonry Website of the National Research Council's Institute for Research in Construction**
<http://www.nrc-cnrc.gc.ca/eng/projects/irc/durable-masonry.html>
- **Old House Journal Website**
<http://www.oldhousejournal.com/>