

SPECIAL 2013



WELCOME TO THE NEW JAZBRICK!

Although we've been in business since 1998, we're excited to unveil a new look and feel for our company. Not only has Jazbrick grown, so has the line of products we proudly carry, and they are now available for viewing on our newly designed website. We look forward to a bright road ahead and to helping you with all of your masonry needs.

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MASONRY THE FOUNDATIONS OF COMMUNITIES



Generations before us had it right and it's not hard to see why essential buildings were made of masonry. Masonry designs create showcase buildings that serve the needs of society, creating and preserving a cultural legacy for generations to come.

It is this long-term thinking, combined with solid action that moves civilizations forward. In challenging economic times, communities are sometimes tempted to sacrifice standards to achieve more for less, but this is not a fitting legacy for future generations, and does not contribute to quality of life for present occupants. Masonry buildings contribute to communities because they last, and because the properties of this time-tested construction fit in with present goals of sustainable living, energy efficiency, durability and comfortable living.

Neighbourhoods that attract occupants combine a lifestyle that encourages people to live, work and play within the vicinity. Multi-use buildings, community centres, residential housing, and business centres ideally should fit into the neighbourhood, providing livable spaces that accommodate a modern busy lifestyle and create communities that thrive.

The masonry industry has been engaging in extensive partnering with people and companies dedicated to these goals. In this edition of Inside MasonryWorx, you will see profiles of modern community buildings that are providing livable spaces for residents; outstanding heritage buildings that have stood the test of time; and communities that have gone the extra mile to provide a forward-thinking lifestyle in present day living.

Always a primary focus, the technical and research-based advances of our industry are outlined in this edition as well. Consumer studies, technical research, and case studies and profiles of buildings, their properties and their performance provide valuable information about the construction industry and building with masonry. These comparisons and examinations of technique, including industry innovations, help advance the construction industry and contribute to the built environment in a meaningful and durable way.

MasonryWorx is committed to providing information to the builder and homeowner; to support the efforts of the design, construction and planning communities; and to be responsive to the development of the masonry industry.

Governments are a key component of any built environment strategy, and the masonry industry is enthusiastically interactive with city planners, municipalities and provincial decision-makers. MasonryWorx and our partners actively meet with MPP's regarding key issues that affect our industry, and assist government officials at all levels in achieving their social mandate for the betterment of Ontarians.

In closing, I would like to thank all our members and allies for your contribution to MasonryWorx. Your dedication and concerted efforts have made this organization strong, effective and forward-thinking. The collaboration between the association and our members is what makes MasonryWorx so vital.

Those companies interested in making a difference for our industry, consider joining MasonryWorx and being part of the future for Ontario communities. We hope you enjoy the Inside MasonryWorx Special Edition 2013. The magazine is meant to be a useful and informative publication, a handy resource for contacting masonry professionals, and a wonderful tool for understanding the full impact and intent of our industry on your own businesses and special interests.

Social and economic conditions aside, the masonry industry, like the products we represent, has weathered the challenge and stood the test of time. We welcome your input on our activities and mandate, and hope to hear from you about our collective contribution and yours to this important industry.

Jack Prazeres President, MasonryWorx



Masonry Contractors' Association of Toronto

Members helping members

The Masonry Contractors' Association of Toronto (MCAT) is an association that represents approximately 200 masonry contractors engaged in bricklaying and stone masonry construction in the Residential and Industrial, Commercial and Institutional (ICI) sectors of the construction industry in the Greater Toronto Area (GTA). An employers' association engaged in Industrial Relations, MCAT has represented its contractor members in collective bargaining with the Bricklayers', Masons Independent Union of Canada, Local 1 for fifty years and for twenty years with the Universal Workers Union, LIUNA, Local 183. Our members employ approximately 2,700 bricklayers and bricklayers' assistants and account for 70% of all masonry construction in the Greater Toronto Area (GTA).

Further to its collective bargaining role, the Association engages in matters relating to Labour Law reform, Occupational Health & Safety, the Workplace Safety & Insurance Board as well as initiatives involving Industry Promotion and Apprenticeship Training.

In addition to its contractor members, MCAT has an Associate membership of companies engaged in the Material, Equipment and Supply of masonry products and services. This initiative has resulted in increased knowledge, skill, and proficiency in the construction of masonry wall systems. MCAT maintains a healthy dialogue with its Associate members, who work closely with MCAT contractors to produce an effective wall system that meets the long-term needs of homeowners, businesses and the communities where they live and work.

With a tradition of integrity, expertise and commitment, MCAT has established a resolve to promote and assist in promoting the welfare and business interests of its members, and to promote the interests of an industry that has existed for centuries. Faced by an ever-changing business and construction environment, MCAT members are committed professionals who embrace change integrated with proven work practices.

Working together as a professional team has always been the way at MCAT. Members know and understand that teamwork makes the difference and teamwork provides them with a strong unified voice. In an industry so often defined by changes, the Association continues to maintain its reputation through a firm and solid commitment to its members and the members, in turn, provide the Association with their solid support.



WHO IS MASONRYWORX?

AN ASSOCIATION OF INDUSTRY PROFESSIONALS, COMMITTED TO COMMUNITIES THAT STAND THE TEST OF TIME

MasonryWorx believes in communities that contribute to quality of life in Ontario. We represent industry professionals who create durable structures that increase in value, reduce greenhouse gas emissions and add beauty to neighbourhoods.

Our membership includes product manufacturers, suppliers and skilled professionals from across Ontario. We are united in our commitment to providing homebuyers, homeowners, architects, engineers, builders and government leaders with accurate, timely information about the use and benefits of brick, block and stone masonry products.

MasonryWorx is proud of our members' contribution to communities. The benefits of masonry are everywhere, and enhance our neighbourhoods and business environments. Masonry looks beautiful. It lasts. It's safe. It helps prevent and contain fire. It's environmentally friendly. It costs less to maintain and earns more in resale. That's why smart communities are choosing–and using–masonry building products.

MasonryWorx For YOU!

Our mandate is to promote the use, understanding and benefits of masonry professionals, products and systems in the design and construction of communities throughout Ontario. We continue to build strong relationships with local and provincial governments to ensure the proper use and legislation of our product to the benefit of communities, and we work with allied industries, planners, engineers, specifiers and designers to inform, educate and support building projects using masonry products.



Conducting research projects with accredited third party groups, such as Altus Research Group and Pollara Strategic Insights, MasonryWorx provides members, government and partners with reliable industry and consumer information. Our work on codes and standards, and that of our partners, provides invaluable input into best practices, ensuring sustainable, structurally sound construction using our products.

Committed to health and safety issues, MasonryWorx supports studies and innovations in our products that improve fire safety, air quality issues and environmental stewardship, and forms partnerships with third parties such as the Coalition for Fair Business Practices and the Firefighters' Association of Ontario to support the advance of safety and standards in construction.

Sustainable Development is a priority commitment for our industry. MasonryWorx serves on committees, conducts research, educates and informs, works with government and allies, all to ensure sustainable building practices in our industry, and to promote environmental thinking and implementation in construction practices and building design.

The masonry industry is responsible for the employment of 14,220 person years in Ontario and 30,500 person years in Canada accounting for \$1.3 billion in household income in this country. MasonryWorx represents 33 member companies and associations, and the masonry industry accounts for a \$2.6 billion economic impact in Ontario, and \$5.5 billion in Canada.¹

Research shows that 89% of homebuyers in Ontario prefer a masonry home, and that 77% are aware of the superior fire safety offered by a masonry building.²

Become a Member of MasonryWorx!

Join us in our efforts to create communities that last! As a MasonryWorx member you will receive recognition and partnership in key industry promotions, government relations and initiatives, and have access to our research studies.

BENEFITS OF MEMBERSHIP

• Quarterly newsletters – association members' logos are featured on the back page

• 2 Masonry Monitor reports per year – economic industry updates

• Access to the industry research and key economic impact studies conducted by Altus Group and Pollara Strategic Insights

- Listing on the MasonryWorx website as
- a GOLD, SILVER or BRONZE member
- Inside MasonryWorx membership directory, including free listing and logo
- Representation on key government relations issues – Legislative changes,
- Codes and Standards, other industry issues • Member of the Coalition for Fair
- Construction Practices
- Member of the Canadian Joint Concrete Sustainability Hub

• Member of BILD (Building Industry and Land Development) and OHBA (Ontario Home Builders' Association)

• Participation in the Ontario Masonry Design Awards and other industry initiatives

- Advertising campaigns in builder and consumer publications to
- promote Masonry
- Comprehensive PR campaigns

• Contact with allied industries, ENGOs and partnerships that promote and impact the industry

• Invitation to attend MasonryWorx monthly board meetings

To become a member of MasonryWorx, request information about our research projects, ask a technical question or inquire about our members, health and safety issues, codes and standards, or general inquiries, please contact us:

Email: info@masonryworx.com Phone: 905-760-9679 or visit our web site at www.masonryworx.com

1. Altus Research Group, Profile and Prospects for Masonry Products in Ontario

2. The New Homebuyers Survey, conducted by Redfern Research and Pollara Strategic Insights

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14' étage

SEP 1 2 2012

Mr. Jack Prazeres President MasonryWorx 10 - 150 Jardin Drive Concord, Ontario L4K 3P9

Dear Mr. Prazeres:

It is my pleasure on behalf of the Government of Ontario to thank the members of MasonryWorx and the masonry industry for your important contributions to building a strong and safe Ontario. It takes expertise, dedicated commitment and a lot of hard work to make this province one of the best places in the world to live and work. Your members, together with your labour partners and workers, play an integral role in Ontario's success.

We all know that safe work environments are crucial to ensure sound, successful construction projects, including public infrastructure. The masonry industry's contributions to projects ranging from residential dwellings to landmark public events such as the 2015 Pan American and Parapan American Games have helped to build and sustain the communities that make our province great. I appreciate the support of your members to strengthen industry best practices, health and safety innovations and sustainable development.

As Minister of Labour, the health and safety of Ontario workers is one of my top priorities. Ontario is a leader in workplace safety, but we know there is more to be done. That's why our government appointed a panel of industry experts to conduct a comprehensive review of Ontario's occupational health and safety system. As a result, we have a new Chief Prevention Officer, Mr. George Gritziotis, and appointed a Prevention Council to support him in his efforts to develop a provincial strategy for preventing worker injury and illness.

I call on all members of the industry to work with Mr. Gritziotis to make safety a priority in all of Ontario's workplaces. I know that I can count on you and your members to help construct an even stronger safety culture. Together, we'll build healthier, safer workplaces and a brighter future for all Ontarians.

Sincerely,

i Jopp

Linda Jeffrey Minister

8

MASONRY INDUSTRY IMPACTS THE ECONOMY

THE FINDINGS OF AN ALTUS GROUP STUDY*



The impact of the masonry industry reaches into the social, economic and environmental framework of our society. Accounting for all products, installation and resulting activity, the masonry industry represents \$5.5 billion in economic impact, \$2.6 billion of that in Ontario. It contributes \$2.8 billion to the GDP of Canada, and \$1.3 billion in Ontario.

With such a strong contribution to the economy, the masonry industry is a key economic driver and a pivotal contributor to the wealth, and health and safety of our communities. The masonry industry is responsible for 30,500 person years of employment in Canada, and 14,220 in Ontario. The people and companies that participate in this industry are major contributors to the way of life most Canadians have come to enjoy.

Those person hours and the sale of masonry products and services account for \$1.3 billion in household income, and \$600 million in Ontario salaries. This means that the contribution of income to Canadians from the masonry industry represents a significant impact on consumer spending and tax contribution.

The masonry industry participates in third party research and conducts our own studies and surveys to monitor our contribution to Canadian society. Keenly aware of our role as a social contributor, the key mandate is to build communities that last; that hold their value; and that are safe and comfortable, environmentally responsible and aesthetically beautiful. This is a trust that is taken seriously in all aspect of our business, from environmental stewardship to fire testing, adherence and consultation on codes and standards, improving health and safety standards, and building durable structures that will serve future generations and enhance our communities.

With the current economic outlook of steady incremental growth over the next five to eight years, the masonry industry is working to contribute innovation that will maintain and improve product quality and installation methods, and provide choice in building design to enhance the contribution of brick, block and stone to building and structure design. The role of MasonryWorx is to communicate the contribution that our members are making and facilitate innovation and partnership that will enhance this growth trend for our industry and the industries we support.



Housing Starts, Ontario 1978 - 2021



Economic Impacts of the Masonry Industry in Canada Total Economic Activity





For more information on the Altus Group study or our Masonry Monitor report, please see our web site at www.masonryworx.com, or contact us at info@masonryworx.com

The CLAY BRICK advantage



The Clay Brick Association of Canada (CBAC) acts as a technical and promotional resource for the Canadian construction industry. It is comprised of five clay brick manufacturers operating plants in Ontario, Quebec and Nova Scotia. Together, CBAC members account for over 99% of the clay brick made in Canada. CBAC members produce clay brick to meet or exceed the CSA Standard A82-06 "Fired masonry brick made from clay or shale"

Design Flexibility - an almost endless variety of colours, textures, sizes and shapes available.

Sustainable and Healthy - natural, recyclable and energy efficient (free of toxins)

Durable - won't fade, rust, dent, rot, peel or fade!

Low Maintenance - no painting or washing required

Secure - superior impact and fire resistance

Acoustic Resistant - reduced transmission of noise



For more information contact us info@claybrick.ca http://www.claybrick.ca Clay Brick Association of Canada P.O.Box 59572, Mississauga, Ontario, L5H 1G8

STUDY PROVES CONSUMERS PREFER MASONRY

Masonry homes offer better value and are more affordable than some may believe.

A survey on new homebuyer preferences shows that 89% of Ontario new home shoppers prefer a house made of brick or stone, but most also believe it is the most expensive option.

The idea that opting for a masonry exterior is more expensive is a myth potential homebuyers should see past, says MasonryWorx Past President, Dante Di Giovanni. "Building your new house out of brick versus vinyl, for example, adds only 2 to 4% to the cost of the house," said Di Giovanni.

Manny Brilant, Senior Design Manager at Greenpark Design and Project Management says that, "the majority of our purchasers have continually shown their preference for brick and stone because it is available in a broad range of colours, easy to install, relatively maintenance-free and durable. Also, because brick and stone tend to hold their value well, the home is easier to re-sell."

North American real estate professionals estimate that a brick home has a resale value 6% higher than homes built with alternative exterior materials, compensating for the initial investment in a masonry home.



• Pollara Homebuyers Survey •

To see the full *Pollara homebuyers survey*, go to the members only section of the web site at ww.masonryworx.com, or email MasonryWorx at info@masonryworx.com.



A computer simulation by the National Association of Homebuilders found that masonry buildings are 12 to 17 percent more energy efficient than other traditional building materials, even when the R-value of the building is 30% higher than industry standards.

"These are the tangible costs. What the numbers don't show are the additional quality of life benefits of building with masonry – less street noise from neighbours combined with the greater peace of mind that comes with improved fire resistance," said Di Giovanni. "With small lot sizes and houses being built closer together than ever before these benefits cannot be overlooked."

The new homebuyers survey, commissioned by MasonryWorx, was conducted by Redfern Research and Pollara Strategic Insights to gauge consumer attitudes and awareness of masonry products. The study was conducted using The Pollara Townhall, Pollara's online panel of more than 250,000 Canadians,

"Masonry homes offer better value and are more affordable"

recruited entirely from random-digit-dial telephone surveys.

The survey also revealed that 78% of new homebuyers put energy-efficiency of their home as a top priority, and that 77% are aware of the superior fire resistance offered by a masonry home. When it comes to dividing walls, 91% rated concrete block the best material for fire resistance.

Pollara Strategic Insights reported that 80% of new homebuyers put masonry first in durability, fire resistance, stability in severe weather and increased value of their home, and most agreed that quality of the building structure is more important than interior finishes while 80% said that exterior finishes matter to them.

RED SEAL CERTIFICATION MEANS SKILLED WORKERS FOR THE **MASONRY INDUSTRY**

The Masonry Industry recognizes the need for a skilled workforce that can deliver the innovative, sustainable designs of today's buildings. An ongoing commitment to high training standards is an essential component of this requirement, and encompasses a comprehensive effort to develop and maintain effective training methods that meet the evolving and increasingly demanding designs of buildings today.

The LIUNA Local 183 Training Centre has long been dedicated to training skilled, eager and competent Brick & Stone Mason apprentices. As an approved Training Delivery Agency (TDA) under the Ministry of Training, Colleges and Universities for the Brick & Stone Mason sector (Trade code 401A), the LIUNA Local 183 Training Centre strives to provide sectorbased skills and knowledge in a modern learning environment.

The Brick & Stone Mason classes (levels 1, 2 & 3) are a critical part of the apprenticeship education portfolio at the LIUNA Local 183 Training Centre. The class format integrates both an academic and practical approach to learning and training, preparing and progressing students through their in-class training requirements in anticipation of completing all aspects of the red seal certification process. Once





students complete all three in-class levels, as well as all required 5600 hours on the job, apprentices become eligible to request to write their final certification exam with the aim of becoming red seal certified masons.

The hands-on experience is intended to simulate a true construction sector setting to ensure that contractors receive workers who are competent and productive. Our three full-time Brick & Stone Mason instructors have a combined experience of 30 years. Currently, Brick & Stone Mason classes run from two key Local 183 Training sites: Vaughan and Cobourg. The training program mirrors the provincially established curriculum, but also has a strong capacity for flexibility and adaptation in order to meet the continually changing needs of the brick and stone sector. The Masonry Contractors Association of Greater Toronto is an integral contractor association partner for the Local 183 Training Centre and is an active participant association on the board of trustees.

Specialized apprenticeship training for the Brick and Stone Mason field encompasses a broad array of skills in brick, block and stone relevant to high-rise, low-rise, residential, and commercial sectors. Learning approaches reflect ongoing technological innovation at the LIUNA Local 183 Training Centre including two new high-rise structures and a tower crane at the Vaughan Campus intended to replicate high-rise sector needs. The training centre has supportive partnerships with various sector-based suppliers like: Brampton Brick, Arriscraft, and Newcastle Block, who provide materials for training.

In addition to the Brick & Stone mason training, the LIUNA Local 183 Training Centre provides a wide array of other Apprenticeship Training, Construction Skills Training, as well as Health and Safety Training from four key campus sites in Southwestern Ontario: Vaughan, Cobourg, Toronto and Barrie. Training opportunities are intended to complement and enhance the diverse needs and demands of the broader construction sector.

The Local 183 Training Centre is committed to our membership and our local communities in providing them with the best service possible. We are working together to establish new programs that will continue to assist our membership and apprentices in becoming the best trained workers in the industry.

For more information, please contact our administrative offices at 416 242 7551. Visit us at www.183training.com

Style, Strength, Safety & Savings A Masonry Home Has it All....

A recent study shows that 89% of homebuyers prefer a home built with the beauty of masonry. But the reasons to buy a home with brick, block and stone go well beyond aesthetics.



ENERGY EFFICIENT: Masonry homes retain warmth, reducing energy costs by as much as 13%

ENVIRONMENTAL: Masonry comes from local sources, and its durability and energy efficiency decreases your environmental footprint

HIGHER RESALE VALUE: Real estate professionals estimate that a brick home has a 6% higher resale value



MAINTENANCE FREE: The masonry in your home will look good and perform well for many years, reducing maintenance costs

FIRE PROTECTION: Masonry stands up in extreme conditions. Fire testing shows that a block firewall will block the spread of fire for several hours longer

EXTREME WEATHER PROTECTION: Brick, block and stone better withstand high winds and extreme weather

PRIVACY: Masonry provides an effective sound barrier from neighbourhood noise, for peace and quiet in your home

SUPERIOR INDOOR AIR QUALITY: Masonry materials do not produce volatile organic compounds, so you can breathe easier in a masonry home

MOULD RESISTANCE: Masonry wall systems offer defined water management strategies that keep your home drier and resist mould



A masonry home adds only 2 to 4% to the cost of your home, so enjoying the benefits of masonry is an investment that pays for itself.

BECOME A PREMIUM MASONRY BUILDER!

MasonryWorx is the industry leader in providing homebuyers and builders with the information they need to build a better home with masonry. To learn more about the benefits of building with brick, block and stone, and to request a **FREE** listing as a premium masonry builder, visit our web site at www.masonryworx.com







LAFITT® STONE

A modular stone with a natural look, available in a range of subtle colours, offering an exclusive finish and a chiseled texture.

TO LEARN MORE ABOUT LAFITT STONE OR RECEIVE OUR FREE BROCHURE, CALL US AT **1-888-737-6226** OR VISIT **PERMACONPRO.CA**



BUILD A BETTER HEALTHIER BASEMENT WITH CONCRETE BLOCK MASONRY

When it comes to constructing or expanding your living space and increasing the value of your home, look to concrete block masonry for a basement foundation that offers maximum versatility, strength, dryness, energy-efficiency and durability at a minimum cost.

Concrete Block is Economical

Concrete block foundation systems offer savings, even in first-cost investment. Building with concrete block requires less reinforcement and less detailing and on-site inspections, while design and construction requirements for block foundations are minimal. Block masonry is constructed straight, square, plumb and level, making above-grade framing and interior and exterior finishes easier to complete, which shortens building times and reduces construction costs.

Strength and Durability

Concrete block is inherently strong and resistant to structural loads, impacts, mechanical damage, abrasion, forced entry, and abuse. Unreinforced concrete block masonry foundation walls have been used to resist soil pressure against exterior walls, and today thin reinforced concrete block walls can easily be constructed to safely resist higher backfill soil pressures over any foundation and backfill height.

"Concrete block produces no smoke or gasses under heat, posing no threat to human safety due to inhalation of toxic substances."

Sustainability

Concrete block masonry has a carbon footprint 66% smaller than that of cast-inplace concrete wall systems.¹ At manufacture, environmental impact is minimized because concrete block is made from local, virtually inexhaustible supplies of raw and recycled materials.



During construction, block versatility helps minimize on-site waste and disposal. Once constructed, the masonry lasts for decades without deterioration. At the end of its service life, block can be salvaged and reused, or recycled in various forms.

Energy Efficiency

Unlike light-frame construction materials, concrete block offers a high degree of thermal mass,² stabilizing interior heating and cooling which lowers energy costs and provides a more comfortable indoor living area.

Block masonry walls can be insulated with a variety of products ranging from rigid board to loose fill insulation. Insulation can be placed on the interior or exterior surfaces of the block to provide a continuous plane of thermal resistance, without heat loss through thermal bridges.

Resistance to Fire

Concrete block is a noncombustible material that neither ignites nor supplies fuel to a fire. Laboratory tests show that no building





material offers better protection against fire, smoke, and heat. Industry-standard CAN/ULC S101 fire tests show that materials such as wood and gypsum board burn or rapidly deteriorate, while block remains intact even after prolonged exposure to intense heat. Concrete block



produces no smoke or gasses under heat, posing no threat to human safety due to inhalation of toxic substances.

Block Provides Better Air Quality

Block is pre-cured and pre-dried, meaning faster dry-out to facilitate interior and exterior finishing, less risk of mould growth, and less drying shrinkage and cracking. Block and mortar do not emit volatile organic compounds (VOCs), a by-product of many other construction products that can pose serious health risks.³ And block can be used as a wall finish, eliminating the need for paints and other finishes that release VOCs or promote mould growth.

Convenience and Versatility

Block can be installed as is, with no need to wait for custom form-work and framing or pre-fabricated panels.

Unlike other foundation systems, concrete block masonry can be constructed in any shape to easily accommodate non-standard floor plans, lot specifications and foundation wall heights, as well as stepped footings and foundations, and last-minute changes during construction. \mathbf{x}

• CCMPA •

Paul Hargest, Canadian Concrete Masonry Producers Association (CCMPA) 1-888-495-7497 information@ccmpa.ca, www.ccmpa.ca

1. See for example the report, "Concrete Masonry & the LEED® Recycled Content Credit," CCMPA, 2008, available on the Internet at http://www.ccmpa.ca/Download-Files.asp?DID=16 (Downloadable Word file)

2. "The Energy Performance of Log Homes: Documented Energy-efficiency and Thermal Mass Benefits," National Association of Home Builders, 2003

3. Richard Gann, Vytenis Babrauskas, Richard Peacock and John Hall, "Fire Conditions for Smoke Toxicity Measurement," Fire and Materials, Vol. 18 (May-June 1994), pp. 193-199, available on the Internet at: http://www.fire.nist.gov/bfrlpubs/fire05/PDF/f05154.pdf

TOP 5 MASONRY HERITAGE BUILDINGS IN THE GTA

Five Toronto landmarks have been singled out by masonry industry experts as the city's best examples of masonry construction.

"With Toronto's rich history of beautiful and enduring buildings, it's no surprise that most of the iconic and architecturally significant buildings in the city were built with brick, block or stone," says Jack Prazeres, President of MasonryWorx.

The Gladstone Hotel – Built in 1889, this Toronto landmark has been entertaining the city and its visitors for over 100 years. The rough cut stone and pleasing brick have endured in style through changes in neighbourhood and lifestyles, and decades of growth and regrowth.

Old City Hall – Officially opened in 1899, Old City Hall was designed by famed architect, E.J. Lennox. Unlike the West Wing of Ontario's Legislative Buildings, which were built of stone to resist fire, Old City Hall was constructed with permanence and aesthetics in mind. Accordingly, Lennox designed the building with the exterior in rock-faced sandstone, the ground level constructed of heavy courses of stone, and masonry above the roof line.

The Distillery District – A National Historic Site, the Distillery District is one of the best examples of the industrial sector's use of masonry building products. Beginning in 1832, the Distillery District made use of its Victorian architecture, ideal for the District because of its form and function. Today, these enduring buildings have been designated as the largest and best preserved collection of Victorian Industrial Architecture in North America.

The Gooderham Building – The Gooderham Building is also known as the Flat Iron building. Built in 1892 on the eastern edge of the city's Financial District, this red brick building, designed in Romanesque and Gothic revival style, was

built for George Gooderham, former president of the Bank of Toronto. The narrow wedge-shaped building highlights how masonry products can be used to create unique architectural style.

Casa Loma – Toronto's iconic castle, and certainly one of Canada's most impressive buildings, Casa Loma was built in 1911-1914 by Sir Henry Mill Pellatt as a setting where he could play host to royalty. The largest house ever built in Canada, Casa Loma boasts white cast-stone battlements, chimneys, and towers, creating an impressive skyline that runs between Walmer and Davenport.

Over the decades, a building can become a home, office, factory or anything in between, but the structure itself remains part of the community forever. Masonry has a life that can span centuries; it resists mould, fire, water, and impact, and requires little to no maintenance. These historic buildings have stood the test of time for good reason.







1. The Gooderham Building. The Gooderham Building is also known as the Flat Iron building.

2. Old City Hall. Officially opened in 1899, Old City Hall was designed by famed architect, E.J. Lennox.

3. The Distillery District. Is one of the best examples of the industrial sector's use of masonry building products.

INDUSTRY



4. *Casa Loma. Built in 1911-1914 by Sir Henry Mill Pellatt as a setting where he could play host to royalty.*



5. The Gladstone Hotel. Built in 1889, this Toronto landmark has been entertaining the city and its visitors for over 100 years.

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HABITAT FOR HUMANITY ENHANCES COMMUNITY WITH MASONRY HOMES BY NEIL HETHERINGTON, CEQ. HABITAT FOR HUMANITY TORONTO

Habitat for Humanity is well known for its social contribution to communities throughout North America and the world. Founded in 1976, and introduced into Canada in 1985, over 2,000 homes have been built for low income Canadian families through Habitat for Humanity, utilizing millions of volunteer hours and the generous donations of partners like the masonry industry.

As an avid Habitat for Humanity advocate and CEO for the organization, I have met individuals in the communities where we work who say, "I love Habitat for Humanity! But I love it more when you are not building next to my home." That sentiment is soon lost once they see what Habitat for Humanity does - how we work, what we accomplish, and our ardent belief that homeownership is the key to breaking the cycle of poverty.

With homeownership comes the sense of responsibility and care when an individual has a stake in the investment. The excellent quality of the home built – in particular the elevations of the proposed development, contribute greatly to that pride of ownership, creating a desire in the new occupant to maintain and enhance the building and contribute to the community.

The homes that Habitat for Humanity Toronto volunteers build are simple, appealing, and affordable, and every effort is made to ensure that the home fits within the context of the community. Therefore, they are attractive, well made, quality homes – something to be proud of and something the surrounding neighbourhood will embrace.

Since 2005, Habitat for Humanity Toronto has made a conscious choice to clad the exterior of our homes with masonry – thanks to our generous friends in the masonry industry. This product lasts a lifetime and beyond, which contributes to the durability of the building; is aesthetically pleasing for enhanced curb appeal; and requires virtually no maintenance, assisting the occupant in the care of their home.

In the affordable housing arena there is a term called 'NIMBY' which stands for 'Not



In My Back Yard'. We tackle this misinformed attitude by building homes using masonry– masonry-built homes virtually eliminate this preconceived notion in the community from those who might have been resistant.

Neighbours know that when we build a masonry home, the quality of construction and the look and feel of the neighbourhood will be upheld. The list of positives doesn't stop there. Choosing masonry materials offers a number of advantages including superior fire performance, environmental benefits, energy savings, and durability. With respect to the last advantage, when compared to alternative materials such as vinyl siding or wood, masonry is tougher, and withstands the rigours of wear and tear, weather and long-term use better than other materials.

Homes built with masonry materials offer a higher resale value, which can mean a better return on our partner families' investment in a Habitat home, as well as raise the value of the neighbourhood overall. Families take pride in the upkeep of an appealing, durable and well-built home, and in being part of a welcoming community – a welcome which is extended more readily to neighbours with an appealing, well-maintained home.

Hanson Brick and the masonry industry have been integral partners in helping to build

durable and appealing quality homes. Hanson has generously donated brick to all of our projects since 2004. Recently, they provided the brick for our new office, ReStore, and our homebuilding factory in Don Mills. Their gift-in-kind conveys a concept of excellence and permanence to our buildings, qualities which help to combat the NIMBY attitude of Habitat home neighbours.

Working together with Hanson and the masonry industry to fight NIMBYism, we provide Habitat homeowners with a solid investment. This year, Habitat for Humanity Toronto will provide a hand up, not a hand out, to 30 families...and Hanson is committed to helping us build better homes using masonry products for families living in need in Ontario.

• Habitat for Humanity • Neil Hetherington, CEO Habitat for Humanity, Toronto

Habitat for Humanity is an international, non-profit organization working towards a world where everyone has a safe and decent place to live. For builds in Toronto, visit: torontohabitat.ca

UPWARD BOUND: ONTARIO MASONRY TRAINING CENTRE

JUST KEEPS GETTING BIGGER AND BETTER

Those who worry that masonry is a dying trade should drop in on the Ontario Masonry Training Centre (OMTC) for a healthy dose of reality. On any given school day at the Mississauga and Ottawa campuses, first-, second- or third-year apprentices are honing their craft with brick, block and stone. They might be perfecting their trowel technique, constructing a stone arch, or building a fireplace of their own design. Alternately, you might find them at a desk, gaining familiarity with safety codes or practicing estimating skills.

Since its inception in 1990, the Mississauga school has helped more than 300 apprentices to reach journeyman status. Hundreds more OMTC students are in the process of completing their apprenticeships (which ideally take four years from start to finish, with apprentices spending a total of six months in school).

Unlike some post-secondary institutions, the school is in no danger of graduating skilled workers with no job prospects: that's because, in order to participate in the government-sponsored program, these students must already have secured masonry employment. In other words, industry demand is solid.



• AUBREY GO • REGISTRAR FOR THE OMTC

"I've heard from quite a few graduates who have started their own businesses; they'll call me later, looking for apprentices from the school."



But the training centre isn't resting on its laurels. If the workshop is a hive of activity, the administrative offices are no less animated. That's because the school is constantly evolving to converge with the future of masonry. Here are some of the ways that's happening:

Pre-apprentices Begin to Scale the Heights If the industry comes to OMTC for welltrained masons, potential masons come to get a foot in the door. Aubrey Go, Registrar for the OMTC, says that she's already hearing from young people eager to take the school's excellent Pre-Apprenticeship Program the next time it's offered.

While the school regularly offers Basic (Level One), Intermediate (Level Two) and Advanced (Level Three) apprenticeship classes, the pre-apprenticeship course, re-introduced in 2012, caters to those who haven't yet found employers. The course, which shadows the first year curriculum, includes classroom learning and hands-on practice, all of which is followed by an 8-12 week paid job placement.

This year, instructor Scott Collie brought his pre-apprentices to work on the restoration of a simple, yet striking, historical landmark – a fifty-foot chimney at the Mountsberg Conversation Area in Halton Region. Dating back to the mid-1800s, the chimney is the only remaining sign of a sawmill run by the grandfather of Lieutenant Colonel John McCrae. McCrae is revered by Canadians for his famous war poem, "In Flanders Fields"; this family connection lends the chimney additional historical interest. In addition, it's hoped that the restored structure will one day provide habitat for the chimney swift, a bird species that is at risk in Ontario.

By all accounts, the partnership between the school and Conservation Halton has been mutually beneficial. "This project would be very difficult to complete without the support of the OMCA," says Norm Miller, Communications Advisor for the community-based organization. "We're really grateful. Without their help, the chimney would have continued to deteriorate and would likely come down on its own." Miller says that there are plans to erect an interpretive sign at the site, explaining the structure's significance.

As for the students, the restoration job really seemed to inspire them, says Collie. "As soon as we got to the work site, they were energetic, eager to climb the scaffold and get to work. They were really helping one another." And, Collie points out, with the skills and confidence gained from this course, they stand a significantly better chance of finding work as first-year apprentices. (As a bonus, those who do well on tests and projects can bypass Basic Level training, provided they pass the entrance assessment for Intermediate Level.) If government funding of the course is renewed, the OMTC will be offering the Pre-apprenticeship Program again in April 2013.

Masonry Fundamentals Provides Another Avenue into the Trade

In 2008, the OMTC partnered with Conestoga College in Waterloo to set up additional masonry training, including a 16week Masonry Fundamentals course. The college course runs regularly at Conestoga, and has also been held at OMTC's Mississauga campus.

According to Conestoga instructor Rene Letoile, the curriculum is roughly equivalent to that of Level One, with some extra instruction in carpentry and an emphasis on safety training. "Tm really focused on making the students as employable as possible," explains Letoile, who completed his OMTC training in 2007.

By any measure, the course has been a great success. "More and more employers are recognizing the program and hiring our students," Letoile says. "We try to keep our standards high; and employers are learning that if the students do well in this program, they'll do well on the job." Not surprisingly, demand for the course is also high, with the most recent class full to capacity and a number of names already on the wait list.

Post-Certificate Courses in Refractory, Restoration and ICI Wall Systems Give Journeymen an Edge

To fulfill the intersecting needs of the industry and journeymen masons, OMTC personnel have been hard at work developing post-certificate courses on three specialized topics.

The first to launch is a six-week program in Refractory Masonry, the dates for which are yet to be announced. "The industry was the catalyst for the refractory course," says OMTC Director of Training, Tim Maxson. "The refractory work force is aging, and they need new, well-trained people." Given that this challenging type of masonry accounts for a third of masons' hours in Ontario, there's certainly incentive to take the course. As of press time, curriculum is being finalized for the second course, which addresses restoration masonry. As our buildings age, Canada is in increasing need of masons with this specialty. In fact, says Maxson, Public Works Canada played a role in the course's conception, in part to ensure there will be enough trained workers for the ongoing work on Parliament Hill.

A third module will address ICI (Industrial Commercial Institutional), with a focus on understanding wall systems. In addition, the school is open to developing short courses for journeymen masons on such topics as hardscaping, fireplaces and restoration, if enough interest is expressed.

Physical Expansion to be Completed Soon

OMTC's Mississauga campus is one of the best-equipped masonry training centres in Canada, and it's about to increase its floor space. The handsome brick building is being supplemented with a pre-fabricated sprung building (referred to by staff simply as "the Tent") with concrete floors and electricity, creating more room for both equipment storage and the teaching of classes.

"Some apprentices gravitate to the excitement of refractory masonry, with its time-sensitive nature and sometimes extreme environments; others to the highly artistic craft of stone carving."

So, Why Choose Masonry?

The reason OMTC is attracting young people is pretty straightforward: it provides an excellent way to learn a trade that's mentally, physically and financially rewarding.

There's no denying masonry is hard work. But there are plenty of young men and women who thrive on hard work, when the results of their labour are so gratifying. "It's one of the few skills that doesn't get covered up, so you can always drive by and see your own work," says Lori Martin, a foreman with Kappeler Masonry who pursued her apprenticeship through OMTC. "Every day there's a new challenge, so you don't get bored. Some people think masonry looks easy; it's not."

In Ontario, first-year masonry apprentices make a good hourly wage, which rises with



A third module will address ICI wall systems

every year of training. "You can't beat it when you consider that you're being paid to learn," says Martin, pointing out that, unlike a college degree, the apprenticeship means that "you don't have to take three years off while you learn, paying tuition and living expenses with no income coming in."

Masonry offers different avenues depending on one's interests and aptitudes. Some apprentices gravitate to the excitement of refractory masonry, with its time-sensitive nature and sometimes extreme environments; others to the highly artistic craft of stone carving. Some like the quick pace of new construction, while others enjoy the meticulous, knowledge-rich craft of restoration.

A number of the school's alumni go on to become masonry contractors themselves. "I've heard from quite a few graduates who have started their own businesses; they'll call me later, looking for apprentices from the school," says Aubrey Go. As far as endorsements go, it doesn't get better than that.

And, with training in blueprint reading, estimation, safety and other aspects of the trade, those who remain with their employer after graduation are in a good position to become foremen of their own crews.

When asked if she thinks she would be heading up a crew without having attended OMTC, Lori Martin responds with an unequivocal, "No."

"I think the schooling really does teach you the skills you need, as well as the confidence," Martin says. "They challenge you all the way along; and in the end, you amaze yourself with what you can do." **x** For more information contact the Ontario Masonry Training Centre

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CONNECTING THE DOTS: FOR 10 YEARS, THE CANADIAN MASONRY DESIGN CENTRE HAS BEEN BUILDING BRIDGES BETWEEN RESEARCH, DESIGN AND ON-THE-GROUND MASONRY PRACTICE **WHAT'S NEXT? AND WHAT'S IN IT FOR YOU?**

Laying the Foundation: Building a Framework for Success

In construction there are many players, each with their own role; these include researchers and academics, architects and engineers, specifiers, owners, manufacturers, suppliers and contractors. What sometimes happens is that each of these players ends up on an island, and their communication with others becomes limited and may not even be in the same 'language'. In order to facilitate the communication and understand someone's needs, a bridge connecting these players must be created.

In 2003, the Canadian masonry industry started building such a bridge, and named it the Canada Masonry Design Centre (CMDC). At the time, industry leaders recognized that, in order to keep masonry buildings at the forefront of new construction, young designers needed greater familiarity with masonry materials.

At the same time, there was an awareness that a number of the country's foremost masonry researchers were retiring. Without new talent, both technological advancement and the potential to educate young designers



• MASSTM •

CMDC engineers are presently in the process of finalizing Version 2 of the design software, MASSTM. "It's extremely important to us to ensure our software stays up to date," says Stubbs. "We're deeply invested in easing the process for designers."



would be seriously impeded. The industry also understood the imperative to build a more direct line between research and the masonry market.

It was obvious that these issues were interconnected, and that the solutions would be, too. Now, it was up to the CMDC, founded with the financial support of their Masonry Contractor members from Ontario, Manitoba, Saskatchewan, Alberta and British Columbia, to create those solutions. Two technical experts were hired, and work began.

Designers needed an 'encyclopedia' in masonry, so an up-to-the-minute textbook was created. Designers needed assistance on an on-going basis, and masonry contractors and designers needed a place to go for information, so CMDC provided telephone support from trained engineers, free of charge. Designers had no up-to-date masonry design software on which they could rely, so complimentary masonry design software was created– MASSTM. Of course, it wasn't really that simple. Many of the Centre's projects have taken thousands of hours to complete, with each project strongly impacting the next. And while working on these larger tasks, CMDC was also reaching out to the research community, playing a role in the creation of codes and standards, developing educational programs, and helping their members propel their local initiatives forward.

"It's all interconnected," explains the Design Centre's Director, engineer David Stubbs. One of the Centre's original engineers, Stubbs is better qualified than most to describe these complex relationships. "The role of research in standards development is what enables us to create design aids, as well as giving us the ability to provide complete answers to any question that comes in over the phone."

Raising the Stakes: The Upward Trajectory of Masonry Research

In recent years, there's been a flurry of investment in research creation across Canada. There are endowed Masonry Chairs at the University of Alberta and McMaster University, while the University of Saskatchewan is home to the Saskatchewan Centre for Masonry Design.

"There are a lot of them now," says Stubbs. "They come from different universities and different backgrounds, but one way or another, masonry has sparked their interest."

CMDC makes an effort to follow the paths of up-and-coming researchers involved with these and other programs. "We're good at reaching out to these young researchers," says Stubbs, "assisting them in their work and, at the same time, getting stepping stones in place for the future."

But it's time to up the ante. "We have seen a renewed interest in masonry-related research. Our job is to support and network with these researchers to mutually benefit all parties," says David Stubbs. "This will help us to ensure that the industry's research funds are being used effectively."

And he adds, "We want to encourage those researchers to develop masonry systems that can quantifiably improve our industry; we want to create a road map to increasing market share through our research."

"Some of our projects have been really challenging, and have taken many years to complete," says David Stubbs."

Perhaps the first destination on that road map is the establishment of the Canadian Masonry Research Council.

CMDC has partnered with the Canadian Concrete Masonry Producers Association (CCMPA) to create this Council, which is intended to be the hub of masonry research in Canada. Among its roles: receiving, reviewing and recommending grant applications; administering research funds; and monitoring supported research. In this way, CMDC will be able to keep its finger on the pulse of research throughout the country.

CMDC's newest employee, Bennett Banting, a PhD candidate from McMaster University, will begin his career this fall leading up the research arm of the Design Centre. "Masonry-related research presents a plethora of opportunities across a vast array of different disciplines – structural, material, environmental, etc. Combined with the incredible interest and support on behalf of the industry, there is a great potential to see dramatic growth and evolution within masonry construction in Canada," says Banting.

Talk to Us: Ongoing Support for Designers and Contractors

For designers, CMDC's tech support line is an invaluable resource – all the more so because it's free. Those who use the service know that it can save them hours of research. At the same time, contractors calling for support are often glad to talk to engineers who will give it to them straight.

"We get a lot of calls from both contractors and the design community about real-world situations in which the two sides may not be quite on the same page," says David Stubbs. "Because we're familiar with both sides of the equation, we're able to provide some thirdparty, non-biased information, so that both sides can get a better sense of where the other is coming from."

"In addition," Stubbs says, "CMDC is accustomed to getting queries about 'the grey areas'– the interpretation of standards, for instance." The technical staff also get more phone calls since the launch of the MASSTM design software in 2010.

Designers are rarely asking for basic technical support; rather, they typically require advanced help with modelling complex structures. "To handle inquiries like these, our knowledge base needs to be pretty broad," says Stubbs.

Help: Design Aids Take it Up a Notch

CMDC engineers are presently in the process of finalizing Version 2 of the design software, MASSTM. "It's extremely important to us to ensure our software stays up to date," says Stubbs. "We're deeply invested in easing the process for designers."

Making use of feedback gathered from users of the first version, Version 2 casts a wider net. "The primary update is that the new version allows for load distribution and openings in shear walls for single-storey structures, which means that the program will be able to analyze each element within the entire wall elevation," explains Stubbs.

This will definitely speed up the process for the designer – but it's certainly not the last software enhancement designers can expect to see. Year to year, Stubbs and his colleagues plan to continually expand the scope of the software, working towards the goal of producing an all-encompassing structural building design.

Another significant shift will occur when the new masonry standards are released in 2014. As Stubbs notes, "Every time we redo the design standards, the design aids need to be updated." Thus, a revised textbook is also in the works.

People Who Need People: The Most Basic Connections of All

If the Design Centre has been successful in making new connections within and beyond the masonry industry, it's because it's overseen by people with a long-term vision of the industry's future.

"Some of our projects have been really challenging, and have taken many years to complete," says David Stubbs. "At the same time, they fill a long-term need for the industry."

"That's where the constant support and push from our Directors has been invaluable. They've given us the financial resources and the mandate to continuously expand the scope of what we offer."

Working in balance with the Directors are the Design Centre's staff. With the addition of Banting, CMDC now has a total of five technical people providing engineering resources. As Stubbs himself points out, the staff are highly educated, energetic and fairly young. "We're all invested in this industry," he says. "We're young enough that we see long futures for ourselves here."

Anyone who spends some time at CMDC is likely to soak up some of that youthful optimism. These men and women understand that they're being given an opportunity to effect real change. "That's why people have been eager to come and work here," says Stubbs. "They know they can create their own mark within the industry."

While it's hard to predict precisely which breakthroughs will be made over the next ten years, it's evident that those breakthroughs will have far-reaching consequences – for designers, researchers and every player in the masonry industry. CMDC's goal is to continue to provide the tools of success for an industry committed to ongoing growth and innovation.

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A ROOMFUL OF INSPIRATION:

THE BEST OF THE BEST WILL BE RUBBING SHOULDERS AT THE 2014 ONTARIO MASONRY DESIGN AWARDS

When a great building first goes up, people notice. Generations later, that building will still make an impact on everyone who sees it. As members of the masonry industry, the work we do has lasting power.

Yet we live in a sprawling province. While we may admire the sleek new elementary school that we drive past every day, and feel our hearts stirred by an evocative monument in the centre of town, we're often unaware of the exceptional structures going up outside of our own immediate surroundings. Even within Ontario's masonry industry, designers and contractors don't always have the chance to view – and take inspiration from – one another's work.

The Ontario Masonry Design Awards, which were conceived by the Ontario Masonry Contractors Association (OMCA) and debuted in 2010, were created to remedy that.

"We felt that an event like this would provide the industry with a long-needed showcase," says OMCA President Steve Presacco. "It seemed like the perfect way to shine a light on the incredible masonry structures being built in the province. And it's a great forum for bringing masonry professionals together to share their visions."

Puttin' on the Ritz: The Big Night

Like the Olympic Games, the OMDA are held every four years. The second-ever Ontario Masonry Design Awards ceremony and gala will take place on November 15, 2014 at Toronto's Allstream Centre, known to many as the former Automotive Building at the CNE.

It's a fitting location. The Allstream Centre is a landmark masonry building that has been retrofitted with environmentallyfriendly features targeting LEED Silver Certification. This combination of state-ofthe-art technology and a monumental presence can be seen as a nod to the very type of innovation and beauty celebrated by the awards.



Invitations can be downloaded and tickets ordered through the OMDA web site, www.ontariomasonrydesignawards.com, or by contacting Daniela Webb at 905-564-6622.

Presentation Partners: The Movers & Shakers

This time around, the Masonry Contractors Association of Toronto (MCAT) has joined forces with the OMCA to present the awards. As a result, the 2014 event has broadened in scope, and is expected to encourage even greater participation than last time around.

Joe De Caria, General Manager of MCAT, is happy to see his association taking such an active role. "We believe the awards increase awareness of the masonry industry within the construction community," he says.

Beyond that, De Caria feels it's important for contractors to see their work in a different context once in a while. "They're constructing buildings that will last for centuries. The Great Wall of China is still there, no? I think sometimes contractors have to step back from what they're doing to fully appreciate it."

De Caria added, "When our members are older and walking through communities that they've built, they'll come to an appreciation of what they've done through the years. But I hope that participating in Ontario Masonry Design Awards will help them come to that realization sooner."

That's a pretty safe bet. After all, it's by sharing our own accomplishments, and witnessing those of others, that we find both encouragement and inspiration.

"Everyone who takes part in the OMDA comes at masonry design from a slightly different angle," observes Steve Presacco, "but at heart they have the same goal in common: excellence."

Making it Happen: The Major Sponsor The 2014 OMDA wouldn't be possible

without the \$100,000 commitment from its major sponsor, the Canadian Concrete Masonry Producers Association (CCMPA). By any measure, that's a significant contribution.

Paul Hargest, President of the CCMPA, speaks eloquently about the reason his association felt it was the right move: "Ultimately, we're looking for industry harmonization between all the trades, and between union and non-union members. It's our goal to create a commonality of thought that masonry is the material of choice. This time around, there are two contractors' associations involved, so we elected to double the ante to ensure the event goes off with great success. And we [the CCMPA] wanted to be front and centre."

Of the 2010 awards night, he says, "It was a great event. It illustrated some wonderful buildings, and really showcased the versatility, beauty and durability of masonry." While many of the attendees were already committed to masonry, he notes, others were less familiar with brick, block, stone and some of their more inventive applications.

"Because we invite the design community as a whole to see what people in their offices have designed, they get a chance to see



OMDA Magazine

To commemorate the awards, a special edition Ontario Masonry Design Awards magazine will be published. The publication will feature all nominees, winners and honorary mentions, as well as articles on masonry and masonry design. what can be done with these materials," Hargest explains. "The awards have real potential to create creativity in the industry."

Quest for the Best: The Call for Abstracts

In the words of the organizers, the Ontario Masonry Design Awards will recognize "substantial, imaginative and aesthetically pleasing uses of masonry in building design and construction."

If you're a proud member of a masonry design project team in Ontario, consider yourself invited to submit your project to the OMDA (subject to eligibility). The awards committee is accepting abstracts between now and January 5, 2014; if the project qualifies, it will be considered an official Nominee, for which a full submission should be made between February 15 and May 15, 2014. Each nominated project will be visited in person by competition judges, who will represent the fields of architecture, engineering, building construction and masonry construction.

There is an impressively wide range of categories at both regional and provincial levels, ensuring that projects of every description can take part in the competition. With the exception of the two new categories (detailed below), projects must have completion dates falling between July 1, 2009 and June 30, 2013.

Behind the scenes, administrators have been working diligently to thoroughly redesign the OMDA web site, www.ontariomasonrydesignawards.com, which launched in August. In addition to showcasing the 2010 winners, the site provides both a comprehensive look at the submissions process and user-friendly online registration for applicants.

As part of that online registration, applicants are able to easily set up a password-accessed file into which application documents can be uploaded at the applicant's convenience. This means that submissions can be updated right up until the deadline of May 15, 2014 – which is particularly convenient for projects completed in the bleak mid-winter, as photographers can now wait until spring to take those beauty shots.

Broadening the Field: The New Categories

Sensing a couple of niches that hadn't been addressed in 2010, organizers have added two new categories for 2014.



Bryan Thomas, Vesuvius Canada – Industrial Design Provincial Winner

The Revitalization Award recognizes the initiative and vision required to design a repurposed building. Examples of such projects would include a warehouse converted to condominium lofts, or an old town hall transformed into a community theatre.

The Creative/Commemorative Award was created to open up the competition beyond traditional building categories. Eligible entries might feature a monument, wall, fireplace, folly or any other structure that is not a building.

An Affair to Remember: The OMDA Magazine

To commemorate the awards, a special edition Ontario Masonry Design Awards magazine will be published. The publication will feature all nominees, winners and honorary mentions, as well as articles on masonry and masonry design. Those who appear in its pages are guaranteed some great exposure, as the magazine will be widely distributed throughout the masonry industry, as well as to engineers and architects, educational institutions and government agencies.

With so much incentive for entrants, organizers of the 2014 OMDA are looking forward to topping the number of entries – over 300 – considered in 2010. And, with so much talent gathered in one room, they're looking forward to an awards night that's alive with inspiration.

ONTARIO MASONRY DESIGN AWARDS



MASONRY. DESIGN. EXCELLENCE.

A CELEBRATION OF ONTARIO MASONRY EXCELLENCE

Masonry in Ontario has a long history and a bright future. It has a presence in our memories and our hopes, as well as being a tangible part of our everyday lives. Masonry provides the means to create architecture that is innovative, sustainable and secure. Vision, beauty and strength: these are characteristics that radiate from the finest masonry structures. It takes talented minds and hands working in harmony to bring great buildings to life. We believe that such excellence in design and workmanship deserves to be honoured. The Ontario Masonry Design Awards have been created in recognition of the amazing work we do in this industry. Please join us for an evening of celebration.

Visit us online for more information and entry guidelines at www.ontariomasonrydesignawards.com

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For lasting curb appeal, door and window detailing in stone or brick offers an endless array of choices that will boost the beauty and value of a home.

Whether it's clean, contemporary lines or a design that enhances the durability of old-world charm, masonry works wonders in lending a permanent brand of architectural detailing, no matter what the home style.

While shutters have been used for years to accent windows and doors, there's a more dramatic way to add character and style to exterior design. New homeowners and builders seem to be getting that message, as customized masonry detailing is a trend that continues to climb.

"Builders need to attract buyers by doing a little more and that's why we're incorporating a lot of stone and brick detailing into our homes," says upscale custom home builder Rick Rondeau, owner of **Fourteen Estates**. "Not only is this trend going into custom houses but we're also seeing it in subdivisions where builders are highlighting windows and doors because that adds an element of glamour."

Stone and brick detailing, sometimes referred to as a door or window surround, generally comprises a header made of brick, or a decorative precast moulding above the window, door or garage. Sometimes this header is supported by two vertical rails that rest on a sill at the base of the frame.

Brick and stone detailing comes in many shapes, sizes, colours, textures and profile



arrangements. The look can be plain with a smooth finish or extremely ornate with intricate lines, shapes and designs.

Oakville-based builder **Rosehaven Homes** doesn't typically build a home without some kind of architectural detailing around or above a window, door or garage. The medium-size builder favours historical designs that use brick profiling and colour to accent the home.

"It adds a certain aesthetic to a house," says Joe Laronga, Rosehaven's manager of architecture and engineering. "People don't want plain-Jane houses. Brick and stone detailing accents your home and adds importance to the home's architectural features."

Brick soldier coursing is a subtle yet attractive detail often used on the top of garage openings and windows or as a decorative accent along the base of a sill. This technique sees the bricks standing side-byside vertically, like soldiers as the name implies. It can be a different colour than the house but its vertical pattern is what sets it apart and helps break the monolithic appearance of an ordinary wall.

Keystones, which are wedge-shaped stones that accent the top centre of a window or garage opening, are used in a contrasting brick or stone colour and are often enlarged or decorated. When building Victorian-style homes, Rosehaven has featured a red-brick facade offset with buff-coloured stone. This sharp contrast is a traditional feature of Victorian designs.

Brick or stone quoining is an architectural detail often used on corners and sometimes around windows and doors. This purely ornamental design staggers the stone or brick, which adds interest and helps break the uniformity of the home's facade.

The size of surrounds should be proportionate to the size of the opening, although many homeowners choose to keep their surrounds the same size regardless of the size or shape of the opening. In terms of style, windows are naturally a little less ornate than doors thanks to their smaller size.



"Exterior colour trends recently lean toward earthy tones such as rich reds, browns and greys," says **Mountainview Homes'** decor specialist Terri DeMelo. "When selecting colours for masonry or brick, keep your home's resale potential in mind. Remember, you want a colour that stands the test of time and doesn't look dated as your neighbourhood develops."

DeMelo recommends colouring window surrounds a few shades lighter or darker than the home's facade for a subtle contrast that adds elegance. Save more stark contrasts for your main entryway, where you want to emphasize real impact.

"When you present a dramatic front door, it makes your home feel more inviting," she says. "Let's face it, these details give your home lasting curb appeal."

Aesthetics aren't the only reason to consider masonry, though. Adding stone or brick architectural detailing to windows and doors will increase resale value of the home, in addition to making the building 'greener' and superior in air quality.

Masonry emits significantly less volatile organic compounds (VOCs) compared to vinyl building materials. And the fire safety benefits are obvious, as masonry does not burn. In addition, masonry is mould resistant as it more easily resists moisture and doesn't provide a food source for mould spores.

"Virtually all forms of masonry have earned high rankings among non-toxic building products," says Judy Pryma, Sales and Marketing Vice President for Brampton Brick. "Brick, block or stone are cleaner, safer and more eco-friendly."



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THE FIRE SAFETY ADVANTAGES OF MASONRY: Building SAFE Communities THAT LAST

Fire Resistance is a big part of what makes a community safe. As civic leaders plan for the future, occupant safety should come first, and meeting safety needs through design is a critical component.

Masonry products provide superior fire resistance and superior fire performance to protect homeowners and the neighbourhoods where they live, work and play.

• Masonry does not burn, unlike wood, vinyl siding and EIFS (stucco) products. As a result, masonry minimizes the risk of fire spreading from within, and to/from neighbouring buildings.¹

• The Ontario Building Code requires two-hour (and less) firewalls to be constructed only of masonry and concrete: where they separate buildings; in buildings with floor areas that include care or detention facilities; and in buildings higher than 4-storey. And all non-masonry or concrete firewalls must equal the performance of masonry or concrete during fire conditions.

• Masonry maintains structural integrity under fire load for a much longer period than alternative materials having the same fireresistance rating. A masonry wall will continue to carry loads, long after its established fire-resistance rating period has been reached.² • In a fire, masonry does not produce toxic smoke, gases, or vapours. 80% of fire deaths result from the inhalation of smoke, gases and vapours rather than from heat or direct contact with the flames.

• The inherent strength of masonry resists damage from highpressure water streams used by firefighters and impacts from collapsing debris and explosion that otherwise would permit fire to readily pass.³

• Masonry materials may contribute to discounted insurance premiums, according to the Insurance Bureau of Canada, and the Fire Fighters Association of Ontario warns, "owners of higher combustible buildings will likely face higher insurance costs."

<image><text>

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A Masonry Community is a Safer Community

Within 3 minutes a house can be completely over-run by fire,⁵ causing considerable hazard to human health and safety, and danger to pets and prized possessions. Masonry firewalls are designed to withstand prolonged fire exposure so that fire will not spread from one building to the next.⁶ "Fire-spread between adjacent buildings can be controlled through adequate spatial separation between buildings, and/or the use of fire-resistant barriers called firewalls," says Forintek Canada Corporation and CMHC.⁷ With lot sizes shrinking and spaces between houses narrowing, communities are more vulnerable than ever to the spread of fire.

"Cross-laminate timber and other combustible structural components pose concern on multiple fronts relating to occupant safety, firefighter safety and protection of exposures in the event of a fire."

Carl Pearson, Fire Fighters' Association of Ontario

Balanced Design Approach to Fire Safety

To better prepare homes and businesses in the event of a fire, MasonryWorx, CCMPA and other industry experts have outlined the components of a 'balanced-design approach' to building construction that will help prevent the spread of fire:

• A detection system: Warning systems such as smoke detectors warn occupants when a smoke or a fire has been detected and alert the fire department.

• An automatic suppression system: Sprinklers in completed buildings will warn occupants of a fire, and put out many fires before they do much damage to the structure.

• A containment system: Fire containment includes: fire barriers, firewalls, exterior walls, floors and roofs of noncombustible fire resistant materials such as concrete and masonry.

• Compartmentalization: This method of construction divides the structure into smaller areas in high-hazard zones to control a fire until it can be extinguished. It prevents the fire from spreading outside of the structure and, with the right material, will add no additional toxic fumes to the smoke. It is fundamentally important for the compartmentalization to be constructed with noncombustible material, such as masonry.

This balanced approach to fire prevention and safety provides a redundancy so that all elements work together to protect the building from fire damage. The combination of detection, suppression, compartmentalization and containment, along with education and fire drills, give occupants the best possible chance of escaping, while also potentially lowering the overall fire damage.



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THE ENVIRONMENTAL ADVANTAGES OF MASONRY: Building GREEN Communities THAT LAST

Sustainable development is a big part of what makes a community thrive. As civic leaders plan for the future, the link between the aesthetics and durability of a neighbourhood, and its appeal as a place to live, work, shop and play is a critical component.

As LEED (Leadership in Energy and Environmental Design) standard buildings and environmental choices for homes become standard, many North American municipalities are setting a minimum requirement for the use of masonry in residential, industrial and commercial buildings.

• SUSTAINABLE COMMUNITIES – Communities built with masonry don't just look better, they last longer. Masonry buildings require less maintenance than stucco, wood or siding, and provide increased energy efficiency. And masonry uses green materials that are reusable and recyclable for less waste and decreased use of new materials.

• HEALTHY COMMUNITIES – Masonry lowers the risk of health problems that arise from other building materials, such as toxic mould associated with wood and synthetic stucco (EIFS). Out-gassing of volatile organic compounds from treated wood and other materials inhabit the air we breathe, and toxic gas is emitted from vinyl if it catches fire: dangers not associated with masonry.¹

• FIRE SAFETY – Ask your fire chief – masonry construction is non-combustible, fire-resistant, and helps prevent the spread of fire from neighbouring buildings. The inherent strength and integrity of masonry help resist damage from high water pressure streams used by firefighters and the impact of collapsing debris. • EXTREME WEATHER PROTECTION – Masonry resists impact, torrential rains, high winds, floods and fire. Recent studies have shown that a 2 x 4 piece of lumber hurled at a wall in hurricane force winds will not chip the masonry, but travels right through vinyl or fibre-cement.²

• ENERGY EFFICIENCY – Masonry buildings are 8-13% more energy efficient than those built with siding or stucco.³ That's because masonry absorbs heat, stores it, then gradually releases it, leaving the building warm or cool long after the heat or AC has shut off.

• **RESALE VALUE** - Masonry raises and maintains property value. Recent studies show that 89% of homebuyers prefer a home built with masonry.⁴ The real estate industry estimates that masonry homes sell, on average, at a price that is 6% higher but cost only 2 - 4% more to build.⁵



Masonry Products are GREEN Products

Most of the materials from masonry – including clay, limestone, sand, and gravel – are available in virtually inexhaustible supply. A study for the Canadian government concluded that concrete has a lower environmental impact than wood or steel. The quarries used for making concrete consume significantly less land and are more easily reclaimed than forestry operations or iron ore mines.⁶

Masonry products can be salvaged and re-used, reducing demand for new products. Block manufacturers can recycle various forms of industrial waste in their concrete mix. This not only diverts waste – such as fly ash and slag – from landfill, but also reduces carbon dioxide emissions.

LEED Points for Masonry

Masonry characteristics contribute significantly to sustainable construction design for LEED rating points:

- Site-related sustainability
- Water efficiency
- · Energy use and atmosphere
- · Materials and resources
- · Indoor environmental quality
- Innovation and design process





LEED Platinum Building: Earth Rangers Centre

"Masonry offers the most potential for synergy within the LEED rating system. For example, masonry used for the building wall system can contribute towards points in reduction of construction waste, recycled materials content, energy efficiency, indoor air quality and of course durability."

Industry expert, Christine Subasic, P.E., LEED AP

Municipalities Benefit as Quality of Life Increases

Municipalities can have confidence in masonry to enhance communities. The benefits include quality of life for residents and increased revenue for the municipality. A recent study by the A. Alfred Taubman College of Architectural and Urban planning studies⁷ shows that the adoption of masonry ordinance results in:

- Increased property values for homes in a community;
- increased revenue generating capacity for communities both through property taxes and sales tax, and;
- continued population and housing growth.

The research also concluded that the adoption of a masonry ordinance "does not significantly increase the owner cost or rental burden for residents and does not make housing in the community any less affordable."

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BUILDING A SUSTAINABLE FUTURE

BY PATRICK KELLY, P.ENG

For thousands of years, masonry has been and still is the most widely used building material in the world. The rich heritage of historic masonry buildings in Canada, Europe, Asia and other parts of the world bears testimony to the sustainability of masonry as a building material. This article looks at how a number of attributes of masonry contribute to sustainable design and construction. Some of these attributes are included in environmentally sustainable building programs, such as Leadership in Energy and Environmental Design (LEED).

Durability

Masonry units are durable and contribute to building assemblies that remain useful in the material cycle for long periods of time. The use of masonry units, if properly detailed, will minimize the risk and environmental costs of premature failure of building components. Most deterioration occurs to exterior wall components, therefore good building envelope design is essential.

Besides the durability of the materials used for construction, the actual assemblage of the wall system is fundamental in ensuring the durability of the building. An important aspect of the wall system is the presence of a drainage cavity or rainscreen wall system. The rainscreen wall system anticipates that water will get into the wall, either by permeating through the building materials, or by leakage through deficiencies in windows and other penetrations. The rainscreen wall system is designed to direct this moisture back to the exterior. This drainage cavity is an important aspect of any wall system and is now a building code requirement for buildings in the high rainfall area (Moisture Index (MI) greater than 1).

Masonry is also resistant to other forms of degradation such as fire, impact, solar radiation, mould and termites. Because of the durability of masonry and masonry structures, masonry buildings are often ideal candidates for building reuse. Masonry also compares favourably with other claddings in Life Cycle Analysis (LCA) due to its long design life and low maintenance.

Energy Performance

The mass of brick, block, natural and



manufactured stone can provide thermal storage (also known as thermal mass) that can moderate a building's temperature. Masonry can store heat energy and slowly release it, keeping the building cooler during the day and warmer at night. Thermal mass is more effective when used on the interior of a building and insulated to the outside. This is ideal for cooler climates. By using masonry in this way, the heating and cooling needs of the building are reduced and less energy is wasted.

Construction Waste Management

Being modular in nature, and small in size, masonry products are less prone to waste. Designers can maintain the rigour of modular dimensions, reducing cutting of units on site. Concrete block are manufactured to 200 mm height by 400 mm length modules (once the 10 mm mortar joint is added to the unit dimensions). Many clay brick are manufactured to sizes that coincide with these measurements to facilitate coordinated modular construction with concrete block.

The ingredients of clay brick and block are benign and non-toxic and are therefore inert (non-reactive). Hence masonry waste on a construction site can be crushed and used as landscaping material.

Recycled Content

Many concrete block manufacturers use flyash and slag as a portion of their cement in their products. These products reduce the quantity of cement and thus reduce CO2 emissions and increase the amount of recycled content. In addition, quantities of recycled aggregate can be used in some products.

For clay brick manufacturers, any waste unfired (green) brick is fed back into the raw material feed. At some plants, the fired brick (grog) is ground and is also used as raw material feed for brick-making. If the grog is not used for raw material, it is ground up and sold as landscaping material, or used to build quarry roads. No material is wasted or sent to a landfill.

Local/Regional Materials

Because of the large number of manufacturers, most cities are within 800 km of a brick or block plant. Using local materials will contribute towards the LEED regional material credit.

Resources Management

The clay brick industry adheres to strict operating principles which ensure that the choices of future generations are not compromised by activities of the current one. All clay brick quarries operate under License granted by the Ministry of Natural Resources (MNR), in accordance with the Aggregate Resources Act. The License requires an approved Site Plan that typically contains operational, water, progressive and final rehabilitation plans, which are prepared in consultation with interested parties including the MNR, Conservation Authorities and local levels of government.

Additional targets including control of dust and effluent discharge are set by the Ministry of Environment (MOE). Once mining operations at a quarry are complete, the land is carefully and meticulously backfilled and returned to a state as close as possible to the original, to ensure the land continues to offer future generations equivalent potential for use and development.

The goal of the clay brick industry is to make clay mining operations environmentally neutral. In fact, in some respects, the industry actually optimizes benefits from the land for current and future generations. If quarry land was developed before the clay was mined, the mineral value of the land would be locked in and future generations would not have the opportunity to access that clay.

By extracting the clay, rehabilitating the land to pre-quarry use and then developing the land, the community has in fact achieved double the use of this valuable asset. Although the clay used to make brick is a very prevalent natural resource (existing resources will supply the needs of humans for thousands of years), brick manufacturers work diligently to ensure quarry sites are used responsibly and efficiently by developing them in a manner consistent with the criteria of the sustainability concept.

Structure/Finish Combination

Masonry can provide both the structure and the interior or exterior finish combination which reduce environmental and building costs. Brick and block walls and columns have high structural load capacity. Most masonry structures are loaded to a fraction of their capacity.

Furthermore, the face of masonry is visually attractive and does not need any coatings or

finishes, whether installed in an exterior or interior application. LEED offers a credit where low Volatile Organic Compounds (VOC) paints and sealers are used, but masonry does not need either, so VOCs are eliminated completely.

Masonry walls require very little maintenance, minimizing the need for regular upkeep and repairs, and eliminating the associated costs and negative environmental impact.

Reduced Environmental Impact of Manufacture

Another key criterion of sustainability is a reduction in the amount of energy required to produce building materials. Over the past decades, the clay brick industry has successfully committed to and accomplished a significant reduction in the energy needed to manufacture brick. Today, the energy required to manufacture one kilogram of material of fired clay brick is less than 45 percent of what it was in 1981.

The dematerialization within the manufacturing process also contributes to reducing energy consumption and the use of resources. In short, dematerialization translates into doing more with less. One of the goals of sustainability is to accomplish dematerialization without compromising the quality or performance attributes of the product or project. For example, the clay brick industry has reduced the thickness of the brick veneer over the last two decades. from four inches to three and a half inches to three inches, while still maintaining the same level of performance.

With the increased use of scrubbers on new and old clay brick plants, the clay brick industry has aggressively reduced environmental emissions and effluent throughout all steps in the manufacturing process. Fourteen years ago, approximately 52 percent of brick was manufactured from plants with scrubbers. Today that figure is 75 percent and continuing to grow.

Masonry cladding emits no gases, needs no maintenance and is impervious to chemical leaching, a huge bonus to its environmental performance. Moreover, masonry units are naturally fireproof, protecting human lives. They require no coatings or cleaning products which could potentially produce environmentally harmful off-gassing, or toxic fumes when exposed to fire.



Case Study – Jeunes sans Frontieres Secondary School, 7585 promenade Financial, Brampton, ON L6Y 5P4

The Jeunes sans Frontieres Secondary School in Brampton, Ontario, is the first LEED Silver Certified school in Ontario. This building is a shining example of how masonry materials can be used to create a design that is durable and uses regional material. Masonry provides low maintenance, warmth, and superior fire performance. The exterior of this particular school is 75 percent masonry. The front is clad with a red clay brick from Hanson Brick. The gym, classrooms and service rooms are constructed with Permacon concrete block. The school and the training centre are separated by a masonry firewall to prevent the spread of fire between the buildings.

The team on this project was: Architect: Robert Simmons Architect Inc., Toronto, ON

Owner: Conseil scolaire de district catholique Centre Sud-Ouest

LEED Consultant: Enermodal Engineering

Builder: Aquicon Construction

Masonry Contractor: Bernel Masonry

Project Manager: Peter Moffet of Robert Simmons Architects Inc.

Clay Brick manufacturer/type of brick: Hanson Brick –"Regency Red Matt"

Concrete Block producer: Permacon

Patrick Kelly, P.Eng, is Director of Quality Systems at Hanson Brick, Burlington, ON

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SEAMLESS IN SEATTLE:

A CASE STUDY IN INSULATION AND ENERGY EFFICIENCY EXCEEDING THE GREEN STANDARD WITH A BLUE AIR BARRIER

With energy costs showing no signs of abating, architects and builders across North America are factoring energy efficiency into every aspect of their projects. Indeed, minimizing energy use is a key component of 'green' building standards that is gaining popularity among policy makers, home building professionals, and homeowners alike.

In the U.S., the Seattle metro area is leading the way in the adoption of such green building standards. The BuiltGreen® program, a non-profit, public-private partnership between the Master Builders Association and several Washington counties and agencies, is one of the country's most successful initiatives that sets forth guidelines for green building certification. When building new homes in this progressive market, energy efficiency isn't just an afterthought – it's a core design principle. And ensuring an effective, continuous barrier between a home's interior and the famously wet environment outside is a top priority.

But how can builders create the "tightest" envelope to minimize air leakage and energy use? And how can they achieve this tightness while preventing condensation in their wall assemblies, a common cause of mould, mildew, and structural decay?

To achieve BuiltGreen certification, a project must meet specified criteria in several areas of environmental responsibility.

A New Approach

To answer that question, Seattle builders' Build Urban (www.buildurban.com) recently tried a different kind of weatherresistive barrier in a single-family home it constructed in the city's Wallingford



neighborhood. The home, to be built on spec with investor funding, was designed to conform to BuiltGreen 5-Star, the highest rating under the standard, requiring certification by an independent verifier. Tadashi Shiga, owner of Evergreen Certified (www.evergreencertified.com) and Northwest Energy Star, and BuiltGreen verifier, was selected to evaluate and certify the project home. Evergreen Certified consults on a range of green building projects, including high-profile 'net zero' projects designed to be virtually energy self-sufficient.

Ed Gallaudet, principal of Build Urban, says virtually all homes his company builds today are BuiltGreen 5-Star certified. In addition to ensuring a better performing home, he says there's another incentive for builders. "If you commit to building to BuiltGreen 4-Star or above, you can qualify for the Priority Green Program through the Seattle Department of Planning and Development (DPD)," Gallaudet explains. "This entitles your project to expedited review, saving time and costs associated with the permitting and review process. In our case, it shortened our permitting time by about 20% to 30%."

To achieve BuiltGreen certification, a project must meet specified criteria in several areas of environmental responsibility. In addition to responsible site and water management, reduction of toxins and pollutants, and minimizing waste, BuiltGreen calls for reducing operating costs through energy-efficient equipment and systems. According to Shiga, meeting this last criterion demands a high-performance air barrier.



Air Barrier Basics

To appreciate the important role an air barrier plays in a wall assembly, you need to understand how air leakage impacts a home's thermal performance and energy use.

As air passes over a structure, it creates positive and negative pressures on the building envelope. This phenomenon, called 'wind washing', drives air and moisture inside and out of the structure through porous materials and seams, bypassing insulation and rendering it ineffective. Escaping conditioned air from the home due to wind washing can result in significant energy loss. Indeed, Shiga says, "Air leakage can account for up to 30% - 40% of energy loss." And it can make for a drafty, uncomfortable home.

But energy loss isn't the only problem. Architects and builders also have to address the challenge of moisture – both from outside and inside the structure. This means ensuring that wind-driven rain is prevented from breaching the building envelope, especially critical in wet climates like the Pacific Northwest. But moisture vapour generated inside the home – produced by occupants' breathing, cooking, showering, and other processes of daily life – can also create serious problems.

This moisture vapour passes from areas of high moisture concentration to areas of low concentration, and from high temperature to lower temperature. This movement, called vapour drive, causes moisture to pass through a home's porous walls. As that warm, moist air travels through the wall assembly, it cools. If the temperature difference between indoors and outdoors is great enough, the vapour can reach its dew point, causing condensation within the wall cavity. Over time, this can cause a range of serious problems, including mould, mildew, and structural damage.

A 'Jacket' for the Home

An air barrier is needed to block air leakage and keep outside moisture out. In climatic regions where homes are prone to vapour drive, it's also important to enable moisture vapour produced indoors to pass to the outdoors, without condensing. This calls for a vapour permeable air barrier. To illustrate this principle, Shiga uses a familiar analogy.

"Think of the building envelope as a jacket. When we were kids, we wore those old rubber raincoats that were always cold and clammy because escaping moisture vapour condensed on the inside," he explains. "Today, we have breathable fabrics that keep moisture and wind out, while allowing vapour to escape, keeping you warm and dry inside."

Continuing the analogy, Shiga emphasizes the importance of a continuous thermal barrier, with no leaking seams. "Imagine if the sleeves of your rain jacket were just stapled on. Nobody would buy that jacket," he says, comparing this to mechanically applied weather-resistant barriers used on many homes. "In a modern rain jacket, all the seams are sealed to prevent leaks. It's funny – people often expect more of a jacket than they do of their home, their single largest investment. If only people could see what's behind their siding. With typical house wraps, there are gaps and air leaks everywhere."

Sealing the Structure

In an effort to improve thermal performance when using a traditional house wrap, architects and certifiers often apply a sprayon sealant to the inside of the wall structure prior to installing insulation. Instead of this approach, Shiga and the Build Urban team chose to use Henry Company's Blueskin VP[™], a fully adhered membrane that serves as both a weather-resistive barrier and as a vapour permeable air barrier. This insulation comes in peel-and-stick rolls that are applied to the entire exterior surface of the building, creating a seamless, fully bonded envelope.

Tadashi Shiga says it all comes down to comfort. "With a high-performance, green home, owners expect low utility bills," he explains. "But they are often surprised by how comfortable the home is. That's hard to quantify but it means maintaining a consistent, comfortable temperature throughout the house, with plenty of fresh air. Get that right and you'll have happy homeowners."

"With this insulation method, we can seal all the seams of the bottom plates and the mud seal plates, as well as the sheathing, so you have a continuous thermal building envelope with no leaks," Shiga points out. "And because it's fully adhered, it seals around nails and other protrusions. Any air that might sneak in can't migrate under the air barrier into the structure."

Build Urban principle Ed Gallaudet says one important difference became quickly apparent during construction. "With Blueskin VP, we didn't have to do any of the air sealing on the inside that we normally have to do to achieve BuiltGreen 5-Star certification. That's a two- or three-day process that we didn't have to do," he says, noting that this frees up the interior for trades working on electrical, plumbing, and mechanical systems. "That took some steps out of the critical path for the interior, so we were able to get to drywall faster."

Putting it to the Test

Of course, in the final analysis, it all comes down to performance. How would the air barrier perform when put to the test?

As part of the green certification process, Shiga performed a blower door test. With the home entirely sealed, a powerful fan is mounted in an exterior door frame. When powered up, the fan evacuates air from the home, creating a low pressure environment. An air pressure gauge on the assembly precisely measures the rate of air exchange in the home. This is often expressed as air changes per hour at a specified pressure, usually 50 Pascal, or ACH50.

Shiga explains that the Washington State Energy Code (WSEC) calls for measuring specific leakage area (SLA), the airflow rate divided by the area of the building envelope. To meet code, SLA must be .0003 or less– roughly equivalent to 5 ACH50. Northwest Energy Star (and BuiltGreen 5-Star) certification requires 4 ACH50 or less.

The Wallingford home with Blueskin VP achieved an SLA of 0001 or 1.8 ACH50, exceeding the WSEC requirement by a factor of three and the Energy Star requirement by more than a factor of two.

"We were very happy with this result. It surpassed our objectives," Shiga says, adding, "That 1.8 ACH50 is really coming from the ceiling, which is the one part of the building envelope not covered by Blueskin VP."

That tightness translates into superior energy efficiency. "This all comes down to saving homeowners money on their utility bills," Shiga says. "With a truly high performance home in the Seattle area, your heating costs will typically be lower than your water and sewer rates."

Enhancing Market Value

There are other benefits just as important, says builder Ed Gallaudet. "We specifically pointed out to the home buyers the advantages of the Blueskin VP air barrier," he notes. "Over the long term, you will have less draft. You will have a tighter home over a longer period of time because of how it's applied. And you have a better moisture barrier. It gives the owner peace of mind that the home will continue to perform as it should, long after the builder's warranty has expired, both from an energy efficiency standpoint and from a moisture barrier standpoint. The buyers were pretty excited about it."

Does solid thermal performance sell homes faster? "It definitely does," Gallaudet says, noting that the Wallingford home sold quickly. "There is value in building to a green standard. Even homebuyers who aren't that interested in 'being green' are recognizing that it adds resale value. Buyers are beginning to demand it."

Tadashi Shiga says it all comes down to comfort. "With a high-performance, green home, owners expect low utility bills," he explains. "But they are often surprised by how comfortable the home is. That's hard to quantify but it means maintaining a consistent, comfortable temperature throughout the house, with plenty of fresh air. Get that right and you'll have happy homeowners."

That's why Build Urban will continue to build green...and blue. "We have some larger home projects coming up and we plan to use the Blueskin VP air barrier just because it went so well with the Wallingford home," Gallaudet says. "We'll definitely continue to use it." **x**

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BUILDING PROFILES: SUSTAINABLE COMMUNITY LIVING

In the modern built environment, enduring buildings that add socially, environmentally and economically to the neighbourhoods they grace is a community imperative. Most municipalities now have a Green Plan or a Sustainable Development requirement for new buildings that ensures the durability, efficiency, and heritage of individual buildings and the overall neighbourhood. This philosophy is nowhere more evident than in our multi-resident buildings, and of these, retirement living residences are especially important as centres of community, and for their social contribution to quality of life.

Richview Manor, managed by Universal Care Canada, and River's Edge and Oak Ridges, built by Armour Heights Developments are three examples of showcase buildings that combine occupant comfort with solid construction, contributing to the three pillars of sustainable development: social, environmental and economic.

Richview Manor is located on Dufferin Street, north of the 407 Highway at Teston Road. The building itself was designed to fit into the unique combination of heritage,



RICHVIEW MANOR

Richview Manor has 137 suites in all, including studio and one- and twobedroom units. The staff includes: medical professionals, nursing, managers, concierge, an executive chef, two sous chefs and a full dining room service staff.



new stone and brick buildings that create such a pleasing aesthetic in the area.

Details of the exterior of Richview create a unique profile, and make use of durable, warm materials. Stone is detailed with archways, and arches at the top of that tie into the roof structure, fitting into the neighbourhood aesthetic, but also creating a personality for the building and showing an inviting face to residents and visitors.

Architect, Barry Graziani, and Building Designer, Domenic Biase, of GC Architects wanted to design a building that was not only safer, but also provided a better living environment, what they call 'smart engineering' that includes a sustainable development approach to building. "We didn't want a firm that specializes in Institutional buildings," says Joseph Gulizia, President and CEO of Universal Care Canada, the firm that assisted with design of the home. "We wanted a condo/hotel boutique environment first, with the functional requirements of a retirement home."

This was achieved through strategic use of materials. First, the exterior is all brick and stone, which not only provides a look that fits into the aesthetics of the upscale

neighbourhood of Dufferin and Teston, but also looks like a place people would want to call home. "Many of our residents are familiar with masonry, and have had masonry homes all their lives. The use of brick and stone in this environment makes our residents feel at home," says Gulizia, now Manager of Richview Manor.

Exterior LC Cladding was supplied by Brampton Brick: stone for the first floor and alternating wings, and brick to the sixth floor, including the 2nd floor 2,000 square foot patio known as 'Oak Terrace', which provides a warm and inviting place to entertain or just relax. Installed by Village Masonry with a focus on design and durability, the overall result is opulent without being ostentatious.

Durability was also a big factor. "The way you see the interior and exterior of this building today is the way it will look, 10, 15 or 50 years from now," says Biase.

"With precast you get streaking," says Graziani. "We felt that masonry would look better, as it ages with the building and looks richer."

Concrete block construction and poured concrete firewalls contribute to superior fire



safety for residents, some of whom are assisted living. Partition walls make movement to safety zones within the building much easier than a woodframed or steelframed building and could potentially save lives.

"We've taken a balanced design approach to fire safety," says Graziani, "containment, detection and suppression." Masonry achieves the crucial first step by containing a fire so it will not spread to other areas of the building. It has the additional benefit of being noncombustible, so that a fire is much less likely to start in the first place, and won't add fuel to the flames in the event of a fire.

"All the stairwells are concrete block," says Biase. "That means solid construction that will provide superior stability under stress, and bear heavier loads."

"Two-hour firewalls, using concrete block rather than steel stud was not a requirement," says Graziani, "but we, along with the owners, felt it was the right thing to do as vulnerable seniors would live in this environment."

Interior walls of concrete and concrete block also contribute to sound-proofing between units which lowers irritation of individual residents in a multi-resident building.

Occupant comfort was an important consideration. Each resident can have temperature control, thanks to the extensive use of brick and stone in the building. "It was the right decision to make, temperaturewise," says Graziani. "Brick and stone retain heat and insulate from extreme temperatures outside, lowering heating and cooling costs, and modulating temperatures within the building."

A stormwater management system, highefficiency boiler, water filtration before returning runoff to the water table, and heat recovery systems on the property also contribute to the sustainable features of Richview Manor.

"We think we've set the standard for retirement living, in consistency of look, community involvement, safety and resident comfort," says Gulizia. "Even younger people who come to visit say they would love to live here."

Richview Manor has 137 suites in all, including studio and one- and two-bedroom units. The staff includes: medical professionals, nursing, managers, concierge, an executive chef, two sous chefs and a full dining room service staff. The building is set on beautifully landscaped park ground, surrounded by conservation land, a golf course, and residential views. "Richview is aptly named," says Gulizia. "The views are rich."

Thanks to the sustainable qualities of the building supplied by brick, block and stone, Richview Manor will enjoy those views for a very long time. **River's Edge** is an adult lifestyle condominium building in Bolton, Ontario, while **Oak Ridges Retirement Residence**, located in Richmond Hill is a retirement

• RICHVIEW MANOR •

To find out more about Richview Manor visit: *richviewmanor.com* or call Joseph Gulizia at 905-585-5000.

To ask questions about the construction of Richview Manor, call Berardo Graziani or Domenic Biase at 905-795-2601

facility that provides independent and assisted living to residents.

"Armour Heights Developments believes in focussing on the future with Green Building, LEED and Energy Star Standards in environmentally-friendly structures that provide durability and sustainability. We maintain these practises with energy efficient materials," says Frank Mazzotta, President of Armour Heights.

Masonry contributes to these expectations by requiring minimal maintenance and no additional interior finishes or exterior cladding. This results in fewer materials and resources needed to ensure the longevity of the building. Both of these Armour Heights developments consist of an exterior finish of stone and brick masonry. "Masonry is chosen for all of our developments, as it gives character to the structure without compromising the value, sustainability, safety and environmental properties of the material used to complete the project," says Mazzotta.

Another important consideration was fire safety. Armour Heights used sandstone as it moderates the spread of fire without serious cracks. Brick masonry was also used because it offers resistance to fire without damage until temperatures rise above 1200 degrees, and concrete masonry was utilized as dividing walls.

"Concrete masonry is an effective material for fire resistant construction, as there is no loss of strength during a fire," adds Mazzotta.

Other measures that are taken during construction to ensure fire safety include wire insulation, fireproof spray or caulking, sprinkler systems, and fire-rated walls and doors to prevent the spread of fire. All of these measures ensure the longevity of the development and do not compromise the overall design and detail incorporated into the buildings.

The masonry used on **Oak Ridges** Retirement Residence was supplied by Jazbrick and Arriscraft. Other members of



the team included Global Architects and Tribrick. At **River's Edge**, the masonry was again supplied by Jazbrick, while Arriscraft provided the stone. The team consisted of AJ Tegebov Architects, Tribrick and T. C. Bricklayers.

Occupant comfort was a major consideration in the building design. "Sound-proofing is very important, as many of our residents come from homes built with masonry that withstood the test of time. They expect the same quality in their new home," says Twila Isola, Administrator for the properties.

Armour Heights Developments implements a wide array of environmentallyconscientious building features, such as stormwater management, innovative wastewater technologies, construction waste management and energy-efficient systems with lighting, heating and cooling that exceed municipal and national building codes.

Set on the Humber River, along the Humber trail, **River's Edge** was designed to enhance the beauty of the setting. "**River's Edge** is a harmony of setting and design that is matchless," says Frank Mazzotta. "Choosing the right materials for this building was integral to maintaining the beauty of its surroundings."

Oak Ridges is built adjacent to the conservation area of Oak Ridges Moraine, so the environmental qualities and pleasing aesthetic is especially important for this property.

Masonry helped fulfill this goal, and provided residents of these historic neighbourhoods with aesthetically pleasing and environmentally-conscious landmarks that will look beautiful for generations to come.

• ARMOUR HEIGHTS •

To find out more about Armour Heights Developments or ask questions about the construction of River's Edge and Oak Ridges, visit: *armourheightsdevelopments.com* or call Twila Isola at 905-303-7800.

FIRE PREVENTION

COMES FIRST IN NEW CONSTRUCTION

Fire prevention goes beyond the sprinkler system of today's buildings. It encompasses the very materials that are used in the construction of the buildings we plan to occupy.

"Many people think that a sprinkler system is enough to protect human life and property, but with today's modern materials for the construction of a building, fire safety is an even more serious issue now than it was 20 or 30 years ago," says Jack Prazeres, President of MasonryWorx.

Within one minute a house can be completely over-run by fire. Luckily, there are steps that can be taken during the building's planning phase that will help prevent the spread and damage of fire, should it ever occur.

The ideal measure is to use a masonry product in the construction of a home or building. Masonry resists fire and provides high fire-resistance ratings and residual postfire strength. A structure built with masonry will not only help prevent the spread of fire, but will give the building the best chance of remaining standing after the fire has been extinguished.



• FIRE RESISTANCE •

A masonry wall will continue to carry loads long after its established fireresistance period has been reached, and will also resist damage from highpressure water streams used by firefighters to extinguish the fire.



To better protect occupants in the event of a fire, MasonryWorx has outlined three components of a 'balanced-design approach' to building construction that will help prevent the spread of fire:

• Containment: A fire containment system is constructed of structural walls, floors and ceilings of masonry and concrete that provides 2 to 4 hours of protection from fire. Referred to as 'compartmentalization', this system divides the structure into smaller areas in high-hazard zones to control the fire until it can be extinguished. To further limit the extent and spread of fire and smoke, noncombustible exterior walls help prevent the fire from spreading outside of the structure and, with the right material such as brick, block or stone, will add no additional toxic fumes to the smoke.

• Detection System: This system uses smoke detectors to warn occupants when smoke or a fire has been detected and alerts occupants and the fire department.

• Suppression: An automatic suppression system using sprinklers will control or extinguish the fire until emergency responders arrive on the scene. The 'balanced-design approach' is a three step system that works together to protect the building from fire damage. The combination of detection, compartmentalization and containment, gives occupants the best possible chance of escaping while also potentially lowering the overall fire damage.

According to Prazeres, during a fire, a masonry wall will continue to carry loads long after its established fire-resistance period has been reached, and will also resist damage from high-pressure water streams used by firefighters to extinguish the fire. Woodframed buildings will not withstand this pressure, or hold up in the event of this kind of emergency, but rather add fuel to the fire. Less damage, less loss of life, and fewer fires to begin with, are the ultimate goals of firefighters and homeowners alike.

"Safe, structurally sound, fire-resistant homes and communities are something that we all want and should be able to count on," says Michael McSweeney, President and CEO of the Cement Association.

In B.C., where a decision to allow woodframed housing in excess of four



storeys has been enacted, one of the first such buildings in construction set the skyline ablaze in May 2011. The six-storey housing project, which burned down in a fire that engulfed an entire block of a residential neighbourhood of Richmond, caused \$60 million in damage.

"Human life and the safety of our neighbourhoods are at question here," says Bill McEwen, Executive Director of the Masonry Institute of B.C. "Engineered wood products, which are used extensively in these types of buildings, are fabricated with glue, and can burn faster than regular wood products." McEwen further stated on the scene of the fire, "If these buildings had been constructed of concrete block, we would not be here today."

So far, Ontario's building code does not allow woodframed housing over four storeys, but legislation has been proposed that would allow six-storey and above construction in Ontario. In two to four storey construction, woodframe is common and fire prevention and containment methods are critical.

The balanced design approach is one of the

best methods of fire safety; it will stand the test of time and secure the safety of homeowners for many decades to come. Building with masonry exteriors and utilizing concrete block in foundations and dividing walls can go a long way to fire-proofing our homes, condos and commercial buildings.

"We urge residents to consider the question: 'What materials do I want in the construction of the building where my family lives or works?" says Prazeres. "Masonry makes sense because it increases resale value, is energy efficient, and it protects your family."

FIRE SAFETY

THE IMPORTANCE OF THE BUILDING ENVELOPE AND WALL ASSEMBLIES IN FIRE PREVENTION AND CONTAINMENT

BY CARL G. PEARSON, FFAO

In today's world, the public is subjected to an alarming amount of fire hazard. But we encounter so much risk in our day-to-day lives that fire safety is taken for granted. The fact of the matter is, regardless of your age, gender or grade point average, tragedy does not discriminate. We have had 79 fatal fires and 89 fatalities in Ontario during the 2011 year, and in today's age this statistic is not acceptable.

Under Part II of the Fire Prevention and Prevention Act, 1997, – "2. (1) every municipality shall, (a) establish a program in the municipality which must include public education with respect to fire safety and certain components of fire prevention."

Firefighters are dedicated to prevention, and education is the key. With this in mind, it is important for parents and professionals to be engaged in this very important issue, and the materials used in the buildings they occupy is a key component of this discussion.



• FIRE PREVENTION ACT •

"Every municipality shall, (a) establish a program in the municipality which must include public education with respect to fire safety and certain components of fire prevention." What buildings are made of is an often overlooked aspect of fire prevention and safety that many occupants take for granted. Every aspect of a building's structure and its life cycle from inception to demolition is part of the fire prevention initiative.

This evaluation begins prior to the construction and planning stage as dictated by the National Building Code (NBC), the Ontario Building Code (OBC), Private Member Bills/Motions and Municipal Bylaws. Included as part of fire safety initiatives are industry changes that permit use of new products and material, creation of standards for installation of the respective product and the continued maintenance of building components while in service.

During the planning stage, consideration must include: features that will be part of the building, such as detection and communication devices, fire suppression devices, compartmentalisation, load bearing structures, fire rated partitions, etc.; application of combined building materials must be considered since products may negatively react with each other. This, in addition to uncontrolled factors, such as weather and climate and the proximity of the proposed structure to other buildings are among many factors to be considered.

On May 4, 2011 an unfinished six-storey mid-rise wood construction condominium project caught fire in Richmond B.C. "Shirley Balesdent, who lives on No. 5 Road, near Cambie said a four-inch chunk landed at her home, but fortunately didn't spark a blaze. The embers sparked other smaller fires in an adjacent building, in some cases causing rooftop fires that spread into the attic," reported by Martin van den Hemel – Richmond Review.

During the construction phase all stakeholders (including fire safety professionals) may be confronted with a situation where safety features have not yet been installed and are forced to deal with the lack thereof. In this circumstance, the potential fire load may have negative effect



on surrounding structures and will tax the resources of emergency responders, particularly if the building is more than 4 storeys, as the fire departments of many small communities do not have the resources and equipment to fight high-rise fires without entering the building.

The construction stage presents multiple threats related to fire hazard; it is during this phase that unprotected building materials are exposed to many outside variables that



include, but are not limited to, that of process, tools, equipment and machinery used to make the structure. It is also during this window of opportunity that fire safety measures such as encapsulation and fire separation, among other features, are not yet fulfilled, making the structure vulnerable to fire risk.

In the event of a fire during this stage, the incident commander on site from the fire department will perform a risk/benefit evaluation and, provided there is no threat to life, the decision in most cases will be to stabilize, confine, then control the incident from negative impact on neighbouring properties... typically, risk nothing to save

nothing, resulting in the loss of the building and the property within.

Another factor influencing fire safety is the desire for open concept. This type of architecture challenges building designers and the industry to find new product and mechanisms to provide a marketable structure. In part, it is this absence of interior structure that will mitigate containment and promote fire spread. Engineered structural components used to facilitate open concept design often fail under fire condition with catastrophic result; this fact continues to change the way our fire service operates on the fire ground. Dividing walls and/or firewalls are an important element to a building's passive fire protection system; walls are used to subdivide a building into separate fire areas, enclose compartments and contain fire as part of a loadbearing or non-loadbearing situation. The choice of product used as part of this wall system can range, in degree of fire containment quality, from a basic partition that provides limited protection to a fortified unit constructed of brick, block or stone which can add hours to the containment factor in a fire.

The design, use, size, and location of the building structure will dictate resources required during a fire, such as the number of

"Results from a study performed by the National Research Council (NRC) on fire behaviour of lightweight engineered floor joists found that containment of fire spread in a basement area is prolonged with inclusion of partitions installed on the entire ceiling area."

firefighters, apparatus and equipment needed, and whether the fire services attack will be offensive or defensive. In this, the building industry has become more sophisticated with type of product and form of installation used during construction. It is essential that the integrity of components, coverings and applications that make the final structure are used as directed from the manufacturer, and equally important that the unrelated trades working in the same cubic space understand the cause and effect that their actions may have in regard to fire safety, and ultimately integrity of the structure.

Results from a study performed by the

National Research Council (NRC) on fire behaviour of lightweight engineered floor joists found that containment of fire spread in a basement area is prolonged with inclusion of partitions installed on the entire ceiling area. Other considerations with this study may lead to the recommendation for automatic closures to become mandatory hardware for doors leading to and from the basement area.

It is advantageous to include dividing walls in the basement area in order to provide fire separation, not to mention additional support to the integrity of the main floor structure. The use of masonry, such as concrete block, provides a fire resistant barrier that is structurally sound and bears heavy loads under extreme situations. \checkmark

• CARL G. PEARSON •

Carl G. Pearson is the Immediate Past President of the Fire Fighter's Association of Ontario (FFAO), having served two consecutive terms as President. The FFAO is a voice for the more than 19,000 Volunteer Firefighters of Ontario. www.ffao.on.ca

BUILDING PEACE-AND-QUIET: BOOMERS WANT OUTSIDE VOLUME TURNED DOWN

Sound will play a key role in the coming decade as aging baby boomers look to home building materials that block unnecessary outdoor noise.

An aging population combined with the economic reality of smaller lot sizes, government rules forcing intensification, as well as the increasing prevalence of attached homes and condominiums means that the need for effective sound barriers from neighbours and neighbourhood noise will only increase.

"When it comes to smaller lots the problems will always be 'the neighbours'," says Don Campbell, a Canadian real estate expert. "But there are many new building technologies that suppress sound and even though they can cost more, they are worth it in the long run as they become a real selling feature."

Campbell, a real estate investor and researcher who's written four best-selling books about the industry, predicts that noise will become a major issue for homebuyers over the next 10 years. Compounding the issue within single-family neighbourhoods, he adds, is the absence of any type of 'condo rules' that impose sound restrictions and the fact that police today have little time to enforce noise complaints.

For condo owners, especially in high-density urban areas, not only can neighbours be a problem, but the ongoing clamour of outside noise too creeps into your home through walls, windows, doors and cracks.

Do You Hear What I Hear? Noise!

The City of Toronto defines 'noise' as



unwanted sound, and its acceptable level is typically a personal preference, however, there are several elements that determine one's response to sound. Our perception of noise is affected by factors such as our mood, time of day, background noise and our expectations.

Outside 'airborne sounds' reach the ear on the inside of a dwelling by entering through roofs, doors, cracks, windows, floors and walls. 'Impact sound', on the other hand, results from foot traffic, dropped or sliding objects, and travels through construction materials, primarily floors and ceilings.

Overall, sound energy travels through air, water or solid objects. Sound vibrations

strike the eardrum and cause it to vibrate, initiating the process we call hearing. The greater the pressure level that a sound wave exerts when it strikes a surface the greater its sound level, measured in decibels (dB).

The 'sound insulation' of a wall is that property which enables it to restrict the passage of noise or sound from one side to the other. "The rule of thumb in wall sound insulation is simply the more mass per area the better the sound insulation," says Jack Prazeres, president of MasonryWorx, a trade association representing brick, block and stone masonry professionals. In contrast, 'sound absorption' is that property of a material that permits sound waves to be absorbed into a wall."



TECHNICAL



Standards for Managing Sound:

There are a number of ways to assess building materials for their ability to manage sound:

(a) Sound Transmission Class (STC)

The National Building Code of Canada uses Sound Transmission Class (STC) to gauge the ability of floors and walls to isolate sound as it moves between the exterior and interior of a building and between living units in a multi-unit structure. STC rates a product's ability to withstand the transfer of airborne sound at a specified frequency range and is equal to the number of decibels a sound is reduced as it passes through a material. Generally, the higher the STC rating the more noise that is blocked.

(b) Outdoor-indoor transmission class (OITC)

Outdoor-indoor transmission class (OITC) is a standard used for indicating the rate of transmission of sound between outdoor and indoor spaces in a structure. While STC is based on a noise spectrum targeting speech sounds, OITC utilizes a source noise spectrum that considers frequencies down to 80 Hz (Aircraft/Rail/Truck traffic) and is weighted more to lower frequencies.

Noise Reduction Building Tips

For construction industry professionals there are a number of ways to reduce outside noise, improve quality of life and increase property values for the home or condominium buyer. These include:

• Use the high SCT (Sound Transmission Class) and outdoor-indoor transmission class (OITC) rated products. Make it a habit of asking about sound ratings when choosing building materials, and work these sound ratings into your marketing materials. It's not all necessarily in the walls either; in the case of flanking or indirect paths, external noise can actually bypass high mass wall material and transmit through low quality floors.

• Masonry products – block, brick and stone – perform exceptionally well in blocking lowfrequency, airborne noise such as plumbing, heating and air conditioning systems, elevators, amplified music, traffic and aircraft. "The high mass per area of masonry products provides superior sound control because it restricts the passage of airborne noise," says Jack Prazeres, president of MasonryWorx.

• For multi-units buildings concrete block dividing walls can significantly reduce noise from neighbouring units as do concrete and block floors and ceilings. The Ontario Building Code mandates that mid and highrise condos use masonry or concrete for dividing walls and floors for fire-safety; but in low-rise condos (4-storeys or under) and townhouses, using masonry or other high STC rated dividing walls and floors can also help reduce both outside and neighbour noise.

• Triple-pane vs double-pane windows can often help to reduce noise levels if properly installed. Do-it-yourselfers can keep out the din through laminated windows that install over top of existing windows.

• The type of insulation you choose is also important if you are looking to reduce outside noise. Again, the density of the insulation is a key factor to reduce airflow and noise. Stone wool products have higher density and because the fibre is nondirectional, they provide good sound barriers.

• Acoustical doors are important for locations requiring greater sound isolation. Sound control doors are much heavier than conventional doors and can attain significant STC levels. The associated frames and hinges are built to support the additional weight, and particular attention is paid to the design of the perimeter seals. Where space permits it, a second suite door enclosing a vestibule can significantly reduce the noise between the corridor and the suite in condominiums.

• Room placement too can also mitigate sound in new homes. "A trend towards having the master bedroom suite in the basement will also become increasingly prevalent in the years to come as the population seeks a quieter living space," says Campbell. New designs will include silent floors installed on the ground floor, great ventilation, good light, a fireplace and high ceilings.

• For outdoor living space, courtyard designs are now considering not only visual privacy but acoustical privacy as well.

BURNING ISSUE

FIRE FIGHTERS SOUND ALARM ON SIX-STOREY WOODFRAME CONSTRUCTION

BY SCOTT MARKS, ASSISTANT TO THE GENERAL PRESIDENT FOR CANADIAN OPERATIONS, INTERNATIONAL ASSOCIATION OF FIRE FIGHTERS

The rush to allow woodframe construction six storeys or higher in the National Building Code is being billed as an economic saviour of the forestry industry. The International Association of Fire Fighters (IAFF) certainly supports a vibrant economy, but not at the expense of fire fighter and public safety.

That's why the IAFF is asking the wood industry and the National Building Code people to put the brakes on the push for socalled mid-rise all-woodframe construction. There are unanswered questions about fire performance in these structures, and few if any of Canada's urban fire departments currently have the personnel, resources and training to respond safely and effectively to these structures in the event of a fire.

The IAFF represents close to 300,000 professional fire fighters in North America including 22,000 in Canada. In Canada's largest cities and towns, our members are on scene in minutes in any kind of emergency large and small, including a large structure fire where people may be trapped and in need of rescue.

Our chief concern is that the majority of urban fire departments in Canada probably lack the equipment, resources and the training to safely and effectively respond to a fire in a six-storey woodframe structure. The fire performance of construction materials and of completed structures in general is of extreme interest to fire fighters, who may be required to be inside a burning structure long after other occupants have escaped, in order to search for and rescue anyone who may be trapped, and to provide aggressive interior suppression in order to save the building and its possessions. This is what the public expects of us.

While the characteristics and merits of mid and high-rise buildings framed with traditional construction materials such as



masonry and steel are well known and thoroughly documented, there are too many unknowns about the way a completed sixstorey combustible woodframe structure would respond in a fire at this point to predict how such a fire would spread, when structural features will fail and how to contemplate such lifesaving operations as interior search and rescue and interior and exterior suppression.

Neither the National Building Code nor the National Fire Code address fire department response capabilities. There is no reference in the proposal to the NFPA 1710 standard for fire department organization and deployment or any other measure of available fire protection.

This science-based standard, which was issued in 2001 following a consensus process that involved a wide range of fire service and public safety stakeholders, states that in an urban setting, four fire fighters should arrive at a fire in four minutes and 15 to 17 fire fighters should arrive in eight minutes in order to constitute adequate public safety levels. And this is based on a two-storey residential home with no basement! A higher density structure such as a six-storey or higher woodframe building would require a municipal fire department to have even greater resources available. The truth is, very few Canadian cities currently meet the response time and personnel standards for two-storey structures.

Sprinklering as defined in NFPA 13 or NFPA 13R should be mandatory in sixstorey woodframe construction; however sprinklering is not a foolproof solution. Fire can spread through exempted areas such as closets, and sprinklers can be rendered nonfunctional or ineffective due to human or mechanical error.

To that, I would add that extra caution is required because what we are seeing in many communities in Canada is in fact the propensity to reduce fire department capabilities for political and budgetary reasons. Unfortunately, I can point to numerous communities in Canada, large and small that have experienced fire fighter layoffs or are fighting against current initiatives that would increase response times and decrease the personnel and equipment available to respond.

This is another result of today's economic climate. It's the reality that a lot of fire departments are facing. I think society should question whether a time when many municipalities are slashing fire department budgets and reducing fire department capabilities is the right time to permit the construction of residential structures that would require increased fire protection resources.

The truth is, very few Canadian cities currently meet the response time and personnel standards for twostorey structures.

It's not enough to assess the relative safety of woodframe construction against standards such as NFPA 1710 or against current fire department capabilities in any given community. That capability could decrease in the future, leaving the residents of such a structure with even less protection than builders and authorities anticipated when it was built. As the population ages, a greater percentage of citizens have mobility problems, which is another factor to consider, especially if these structures are to be used as care facilities.

The Ontario Professional Fire Fighters Association, a provincial IAFF affiliate, is currently lobbying against legislation that would amend the Ontario Building Code to permit six-storey woodframe structures. The IAFF agrees with what the OPFFA has told the Ontario government about this issue: that the use of combustible structural assemblies will increase failure possibilities in fire conditions.

In our view, the move to allow six-storey combustible woodframe buildings in the National Building Code is set against the backdrop of a code that already fails to provide adequate protection for fire fighters. When the code moved to an objective-based format in 2005, fire fighter safety was not made a core objective, as many observers expected. As a result, fire fighter safety cannot practicably be used as a basis for a code change request.

After being encouraged by the Canadian Commission on Building and Fire Codes (CCBFC) to use the code amendment process to have our concerns addressed, the IAFF in April 2010 sought the addition of fire fighter safety as a code objective. The IAFF proposal was rejected out of hand without notice and without any request for further consultation.

When the IAFF demanded an explanation, we were told that leaving fire fighter safety out of the code was not an oversight. Astonishingly, we were told that existing code language referring to "building occupants" was intended to cover fire fighters, an absurd statement when you consider the roles fire fighters play and the public's expectation that fire fighters will enter a burning building while others are fleeing in order to rescue anyone who may be trapped and to aggressively save a home and its possessions. A background memo prepared by the CCBFC in response to our request revealed the commission was concerned about "major technical, policy and cost implications" of adding fire fighter safety as an objective of the National Building Code.

In 2009, the IAFF asked the CCBFC why the National Building Code, if it's a model code, specifies the lowest levels of protection and not the highest. They had no answer.

In the meantime, the IAFF believes that the push for six-storey woodframe buildings is just the beginning, that the proposal is a trial balloon that will make way for future requests for the National Building Code to allow woodframe buildings in cities across Canada ten storeys and higher. The wood industry is currently seeking approval for a ten-storey woodframe building in British Columbia.

Six-storey woodframe structures are already permitted under the British Columbia Building Code (BCBC). Tragically, the first such structure to be built under the amended BCBC was consumed in a massive blaze in Richmond in May, 2011.

The wood industry was quick to defend the inferno, but the facts spoke for themselves. The truth is that every working fire that firefighters respond to represents not only a danger to the public, but to fire fighters themselves. Large blazes such as the Richmond woodframe blaze also reduce the resources that fire departments have available to handle simultaneous incidents.

A research paper published in October, 2010 by the Library of Parliament explores the idea of amending the National Building Code to permit six-storey wood construction. It extolls the economic and environmental benefits. It even acknowledges fire concerns, but curiously, it fails to cite studies or other concrete information about fire safety, even though it contains cites for its many economic and environmental claims. Fire safety and public safety don't even merit a mention in the paper's conclusion. This isn't good enough when the lives and safety of fire fighters and the public are at stake.

Fire fighters agree that cost factors and economic stimulation are important factors to consider in the construction industry, as in any industry. But they cannot be the overriding factor when a potential danger is present. Fire protection and fire fighter and public safety cannot be overlooked.

Allowing all-woodframe structures, six storeys or higher is being viewed as a "tool for recovery in the forestry industry." But at what price? We believe the price may be just too high. \checkmark



Scott Marks was a professional fire fighter in the City of Toronto for 29 years, retiring in 2010 with the rank of Captain. He was also president of the Toronto Professional Fire Fighters Association before he was appointed to oversee the IAFF's Canadian Operations. The International Association of Fire Fighters, AFL-CIO, CLC, represents close to 300,000 professional full-time fire fighters in North America including 22,000 in Canada and is a leader in fire fighter and public safety.



Figure 3: Installing STYROFOAM[™] Brand CAVITYMATE[™] Ultra Insulation at Holy Name CES Courtesy of Brian Baird, The Dow Chemical Company Inc.

of "ci" in helping to achieve desired thermal and moisture performance. This is in large part due to emerging standards – and provincial and local energy codes based on those standards – placing a greater emphasis on "ci" and its ability to reduce thermal bridging and associated issues. Once the walls are installed, it is difficult to make repairs if air leakage paths do develop, so special attention was applied to resist air leakage through the wall. The same product – a synthetic rubber liquid applied adhesive – was used for the air barrier, to adhere the insulation and then butter the insulation board joints. Although the air barrier consisted of a full bed of adhesive, for extra protection all the board joints were buttered with the same product to deliver a dual backup system. An added bonus of this type of integrated air barrier/insulation approach, is that one trade can construct the design without having to co-ordinate with other sub-trades.

The building owner, the York District Catholic School Board, will benefit from a high-quality wall design over the life of the two schools and will enjoy the superior energy-efficiency afforded by this system. The extruded polystyrene foam insulation reduces building energy consumption and associated CO2 emissions year after year. In addition, if the schools are renovated, depending on the new application, the insulation can be reused. As a demonstrated commitment to the environment, STYROFOAM[™] Brand Insulation was awarded a Silver designation for sustainability, looking at human health, environmental health and recyclability profiles in an independent assessment by McDonough Braungart Design Chemistry (MBDC).

Thanks to an experienced design team using trusted designs and superior products such as STYROFOAMTM Brand CAVITYMATETM Ultra Insulation, the school bells rang out on time in two new schools in York region – as residents celebrated the start of another school year.

• DOW CANADA •

FOR MORE INFORMATION OR TO ASK QUESTIONS ABOUT THIS ARTICLE:

To ask questions about this article: Doug Todd DOW Building Solutions DKTodd@dow.com For more information: See: www.mbdc.com OR National Building Code of Canada CCMC Evaluation Listing #11420-L (see http://www.nrccnrc.gc.ca/ccmc/registry/pdf/11420_e.pdf)

1. R means resistance to heat flow. The higher the R-value or RSI, the greater the insulating power. R-values are expressed in ft2 h °F/BRU. RSI values are expressed in m2 °C/W. R-value determined by ATM C518.

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LIFE CYCLE ASSESSMENT OF BUILDINGS SHOWS BUILDING MATERIALS MATTER

BY: SHERRY SULLIVAN, MASC, P.ENG., LEED AP

Worldwide, 30 to 40% of all secondary energy is used in buildings. As significant as the environmental impact of this is on a global level, not enough is yet known about energy use in buildings, which is correlated to the building type and the climatic zone where it is located.

The majority of energy consumed in buildings is linked to residential buildings, with non-residential buildings also accounting for significant levels of consumption. And in both residential and non-residential buildings, most of the energy use occurs during the operational phase for heating, cooling and lighting.¹

There is a need to better understand the life cycle environmental performance of buildings. Researchers at MIT's Concrete Sustainability Hub have taken on this task in a series of projects to quantify the full life cycle carbon emissions of buildings from manufacturing to disposal. This article will provide an overview of this research as well as concrete's broader contribution to sustainability.

Why Focus on Energy Efficiency?

Concerns about global warming and climate change have led to an unprecedented societal call to maximize energy efficiency and reduce carbon dioxide (CO2) emissions. Energy consumption is a major contributor to global warming potential. So far, in 2012, the concentration of CO2 in the atmosphere is over 392 parts per million.² This is well above the limit of 350 parts per million deemed safe by scientists.

From a business perspective, reducing operational energy consumption will improve the bottom line for building owners³ as it will reduce operating costs.

In 2009, buildings consumed 31% of all secondary energy use in Canada (2,608.3 petajoules (PJ)) and generated 28% of all greenhouse gas emissions (GHGs) in Canada (141.65MT).⁴ Canada's commercial and institutional buildings alone consumed 1,186



PJ of energy and produced 59.3 MT of GHGs. In comparison, the operation of the Montreal Metro transportation system requires roughly1 PJ of energy a year, which is a 1 to 1000 ratio. By 2020, emissions from the building sector are expected to grow by 8%.⁵

Buildings are the Biggest Source of Energy Consumption and Emissions

Buildings are the single biggest source of energy consumption and emissions in Canada and around the globe. The design, construction and operation of buildings are the main sources of demand for energy and materials. In fact, buildings and their construction consume more energy than the transportation sector. The Roval Architectural Institute of Canada (RAIC) and the Canadian Green Building Council (CaGBC) are both actively promoting the need for drastic reductions in GHG emissions from buildings and the necessity of reducing our dependency on fossil fuels.

By the year 2035, nearly three quarters of Canada's buildings will be new or renovated. This a great opportunity for architects and the design and construction sector to be leaders in addressing climate change.

MIT Life Cycle Assessment (LCA) Study⁶

Understanding a building's global warming potential requires a complete Life Cycle Assessment (LCA) that considers all phases of a building's life-from pre-use to decommissioning. The first component in determining a building's life cycle impact is to consider the initial construction phase. This encompasses making a life cycle inventory (LCI) of all products and materials required to produce the building, and is relatively easy to measure. The next phase of the building's life, its service life, is more difficult to measure. Assessing the building's



energy use over its service life requires consideration of the building's operation, repair and maintenance of the building, and is thus essential.

MIT has completed a major LCA Study using U.S. Department of Energy benchmarked models of three building types (single-family, multi-family, commercial). The EnergyPlus simulation program was used to model energy use, and GaBi software, a life cycle assessment modelling software, was used for the Life Cycle Assessment. EnergyPlus allows engineers, architects, and researchers to simulate energy and water use in buildings. Using EnergyPlus enables building professionals to optimize the building's design to use less energy and water.

Two principal findings emerged from the MIT LCA study. Firstly, at over 85%, operating energy is the predominant component of a building's total energy use over its life cycle, and the initial embodied energy is a small component. Secondly, a concrete or masonry structure's global warming potential can be up to 8% lower than a corresponding woodframe structure over a 60-year period, before considering the impact of energy reducing technologies.

This is because concrete's thermal mass can absorb, store and release heat back into the space, as do bricks and stone. This ability to absorb energy slowly and hold it longer reduces peak energy and shifts demands. It also reduces energy use due to reduced heat transfer through the massive elements. Concrete's thermal mass makes it possible to maximize energy efficiency throughout the building's entire life cycle, reducing cost of ownership and energy emissions.

Recent building projects such as Manitoba Hydro Place in Winnipeg have shown that pairing concrete's thermal mass with other smart energy strategies can result in energy savings of up to 70%.

Beyond Energy Efficiency: Concrete's Broad Contribution to Sustainable Communities

Concrete, including concrete masonry, is the most commonly used man-made material in the world. It is the backbone of our infrastructure. Concrete structures provide the essential links-the roads, bridges, ports, utility infrastructure, airport runways, and so on- that enable our communities to function safely and efficiently, as well as prosper financially. Concrete and masonry are also central to the places where we live, work, and play. In a perfect combination of form and function, they offer an infinite range of aesthetic possibilities, helping make our communities as beautiful as they are safe, smart and sustainable.

Produced locally, concrete and masonry products are resilient, durable, energyefficient, cost-effective, versatile and 100% recyclable. With these properties, concrete and masonry play a critical role in building a sustainable future.

An Industry Committed to Sustainability

The Canadian cement, concrete and masonry industries have embraced sustainable development and are dedicated to developing innovative, state-of-the-art products that meet the building needs of today and tomorrow. One recent example of this commitment is the introduction of Contempra cement in the Canadian market last year. The use of this cement in manufacturing concrete decreases CO2 emissions by 10% while still producing concrete (including concrete block and other masonry products) with the same level of strength and durability as concrete produced with regular Portland cement. A new portal on concrete's contribution to sustainability provides access to more information about the sustainability of concrete and masonry, and is available at www.cement.ca.

Conclusion

Highly versatile, concrete and masonry can endure for centuries with limited costs for maintenance and repair, and are continuously evolving to meet today's building needs. With the trend toward urban densification, infrastructure renewal, and the need for highly energy-efficient homes and buildings, design professionals are increasingly turning to concrete, including concrete masonry, as a sustainable building material. When compared to the LCA and cost benefits of other construction materials, concrete is a compelling solution for design professionals looking for environmentally responsible options.

• SHERRY SULLIVAN •

Sherry Sullivan MASc, P.Eng., LEED AP, is the Director of Transportation and Built Environment for the Cement Association of Canada (CAC). Before joining CAC, she was a concrete engineer with the Ready Mixed Concrete Association of Ontario (RMCAO) and a technical services representative for St Marys Cement in Ontario, where she gained extensive experience in the cement and concrete industries. Sullivan can be contacted via e-mail at ssullivan@cement.ca.

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