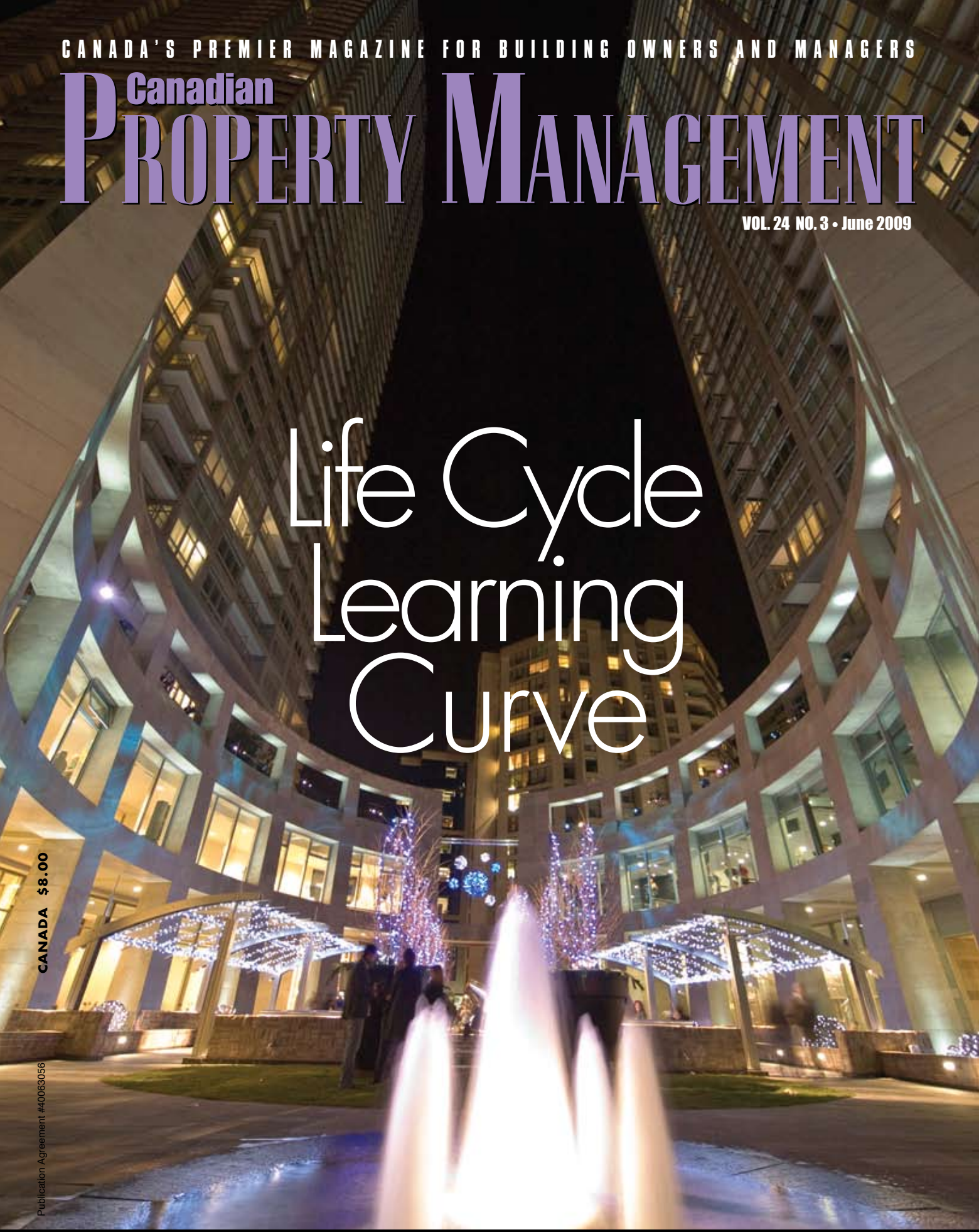
CANADA'S PREMIER MAGAZINE FOR BUILDING OWNERS AND MANAGERS

Canadian PROPERTY MANAGEMENT

VOL. 24 NO. 3 • June 2009



Life Cycle Learning Curve

CANADA $8.00

Publication Agreement #40063056

FACADE MAKEOVER SYSTEMS VERIFICATION & TUNE-UP REPAIRS VS. REPLACEMENT
SOFTWARE DRAWING BOARD MODERNIZATION TRIGGERS PCB DECOMMISSIONING

Quality Control for Design and Construction

Modelling Tool Supports Innovation and Risk Management

By Michael Laurie

SMALL INACCURACIES in structural plans and diagrams can create frustrating setbacks for owners, architects, engineers, builders and fabricators and/or lead to major deficiencies and liabilities. Building Information Modelling (BIM) technology can minimize risk and troubleshoot problems, while also improving efficiency and supporting creativity and innovation.

Earlier technological advances such as AutoCAD and similar software gave design and construction practitioners the ability to display and represent data in a unique format that can be conveniently analyzed and shared with interested parties. BIM has taken that a step further through an interactive system capable of integrating updates and real-time changes to design and construction plans.

Occupancy reports can be automatically updated, changes to floor plans or building features and amenities can be seamlessly incorporated, and detailed product information – from technical specifications to warranties and maintenance manuals – can be integrated into the database for easy access. Meanwhile, the underlying fundamental data is more reliable and accurate because errors related to transference of field drawings to laptops, unwanted changes in scaling when plans are photocopied, and discrepancies between blueprints and as-builts are avoided.

Building managers can refresh plans and consolidate data from multiple sources without requiring assistance from architects. They can e-mail comprehensive BIM plans to architects or share them with government permitting agencies, fire departments, appraisers and insurance companies. They can also customize the digital BIM resources and upload them to the Internet to create virtual building tours for marketing purposes.

Over the years, attempts at innovation or performance enhancement have sometimes resulted in expensive failures. For example, an energy upgrade such as re-skinning a high-rise tower with an insulated exterior cladding could make the interior space too warm or inhibit the building's ability to breathe. Moisture trapped behind the cladding could permeate the building causing property damage, liability and negative publicity.

BIM models can test, calibrate, analyze and foresee such outcomes before ideas leave the drawing board. It provides an immediate visual perspective of any design alternative and/or error.

If the designer moves a window or doorway in front of a structural wall or plumbing pipe, for example, that would show up on the BIM model. Viewers would get the same perspective that one gets when walking through a real building.

Parametric BIM modelling encourages risk-free experimentation, alteration and trial and error prior to committing actual funds to a project. For example, designers can try various layouts and configurations, change the thickness of walls, move windows, upgrade insulation or adjust the lighting or the R-value of a space and then monitor the thermal effects of sunlight over a specific period of time, while also factoring in local weather patterns.

When an adjustment is made in one part of the BIM model, the resulting design and structural implications for the entire structure will also be reflected in the model. When changes

are made in elevation, for example, they must be reflected in planning and scheduling and other related areas. With BIM, data and drawing information is linked and coordinated in the design and construction phase.

Projects are typically delivered faster, more economically and with greater potential for reduced environmental impact – a feature that is becoming more essential as green construction practices gain momentum and drive changes in legislation and mandatory policies and building codes.

Upon completion of the BIM-modelled building, the owner inherits this encyclopedia of information that can be stored in one single and easy-to-navigate file. The BIM model can then help owners and property managers perform an array of tasks for the lifetime of the building – generate budgets and revenue projections, manage rentable space and repurpose information into dynamic marketing tools.

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