

Zeitschrift: IABSE reports = Rapports AIPC = IVBH Berichte
Band: 77 (1998)

Artikel: The dynamic buffer zone system
Autor: Zec, Vera
DOI: <https://doi.org/10.5169/seals-58259>

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

Download PDF: 07.02.2026

ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>



The Dynamic Buffer Zone System

Vera ZEC

Civil. Eng. and Arch.
Yolles Building Science Services
Toronto, ON, Canada



Vera Zec, born 1967, received her architectural degree from University of Belgrade in 1991. She is currently an associate with Yolles Building Science Services Ltd, in Toronto, ON, Canada.

Summary

The main intent of preserving the building envelope of vintage buildings is not to alter the environmental conditions previously experienced by the wall assembly. The technology known as the Dynamic Buffer Zone (DBZ) introduces a layer of warm, dry, pressurized air into the existing wall. The DBZ provides a high degree of containment by controlling the air pressure differentials that cause the moisture flow. The dry, pressurized air also offers opportunities for energy management when it is extended to or through the glazing, and/or combined with the building envelope ventilation air. The introduction of the DBZ between the environmental separator and the interior finish is potentially a reliable way to compensate for minor defects in the building envelope during and after construction.

Introduction

The renovation of buildings with traditional load-bearing masonry walls usually involves window and mechanical upgrades intended to pressurize and humidify the interior space. This strategy inevitably generates environmental loads not experienced by the original enclosure. There is growing evidence to suggest that sustained air pressurization is damaging to vintage building envelopes even when mechanical pressurization is low. The risks of poor performance and damage to the building envelope are high if air leakage and vapour diffusion are not adequately controlled. One proven restoration approach introduces a layer of dry pressurized air into the existing wall assembly. This technology provides a high level of containment by controlling the air pressure differentials that cause moisture flows. The dry pressurized air layer, known as the Dynamic Buffer zone, also offers energy management opportunities when it is extended to the glazing and/or combined with the building ventilation air.

Dynamic Buffer Zone System

YBSS is uniquely experienced in the development, testing and implementation of the Dynamic Buffer Zone (DBZ) wall system in several historical buildings in Canada. These buildings include the Canada Life Building and Rogers Cantell Office Campus in Toronto, and the East Memorial Building, a major historical government edifice in Ottawa. The challenge presented

by these buildings was to develop and design a system that would protect the aged, but preserved, external cladding and at the same time allow for high humidity levels within the interior spaces. The initial proposal of the Architect and Mechanical Engineer was to insulate the inside face of the external walls. However, YBSS determined that although this proposal increased the interior building temperature it decreased the outside wall temperature, thus causing interstitial condensation within the wall as a result of moisture movements. The freezing of the condensate would inevitable result in cracking, spalling and its eventual destruction of the historic wall cladding. Any solution to this problem had to maintain the external appearance of the building.

YBSS proposed the Dynamic Buffer Zone solution. Extensive research and testing led to a solution that utilized the "Dynamic Buffer Zone" (DBZ) principle. The DBZ is essentially a controlled environment around the perimeter that prevents the moisture, heat and exterior pollutants from migrating through the wall.

CONCLUSION

The main purpose of the Dynamic Buffer Zone is to ensure comfortable interior environmental conditions in a building that is undergoing a major interior retrofit in order to extend its service life. The DBZ approach was initially reserved for moisture sensitive buildings, however, there are many other benefits that can be derived from this technology. For example, the control of air movement within the interior enclosure cavities can recuperate energy losses from the building, or dissipate solar gain before it becomes a problem that the mechanical system must address. The conditioning of the wall or window cavities would reduce the need for processing the large volumes of air that are required to generate comfort. The system also ensures an effective wall renovation without modifying the architecture of the original building facade. This air management system has benefits that go beyond operating cost. A technology that controls all aspects of energy and moisture transfer within the building envelope will ultimately produce capital cost savings and an occupant comfort level that is otherwise unachievable through the conventional upgrades. This simple, yet durable, building envelope presents a fundamental component of an exceptional building design.

