Architectural Qualities of Award-Winning, Global, Multi-Unit Residential Buildings and Analysis of Barriers in the Canadian Context

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Abstract

This project addresses the urgent need for high-quality Multi-Unit Residential Buildings (MURB) in Canada that align with building performance standards and design quality. Architectural practice utilizes building precedent studies and analysis of best practices to inform future projects. This project aimed to identify and analyze award-winning global MURB and draw conclusions about strategies for design quality at various scales. Sixty-five buildings were studied, and the results were documentation and analysis of building traits of award-winning MURB, such as narrow building forms, low to medium-rise heights, single-loaded corridors, and stepped building forms. These findings of characteristics of award-winning MURB were then analyzed in the context of Canadian design standards and policy, revealing where there are specific barriers to implementation. This study reveals proven strategies for MURB quality, and results can be used to inform MURB design and renovation in Canada.

Introduction

As Canadian cities continue to densify, there is an urgent need to build and renovate Multi-Unit Residential Buildings (MURB) to meet more holistic definitions of performance in buildings. MURB should be designed to optimize indoor environmental quality (IEQ) and, achieve high building performance (Andargie, Touchie, O'Brien 2019; Kesik, O'Brien, Peters 2019), as well as achieve architectural excellence. For designers, using precedent studies to document and analyze best practice projects is a method where design strategies in built projects can be evaluated to inspire and influence future projects. This study aimed to identify and analyze global award-winning MURB to inform best practice MURB design. Barriers and disincentives exist in Canadian architecture about design quality, and this has led to the majority of Canadian MURBs not exceeding minimum sustainability targets or design excellence. Through the results of this global scan of award-winning MURB, the goal was to identify and analyze best practice architectural design strategies at multiple scales and understand how and why these could be implemented in the Canadian context.

Canadian MURB Example

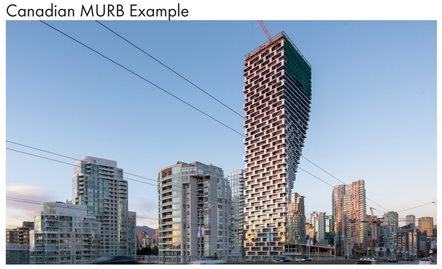
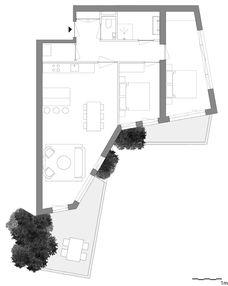


Image 1: Vancouver House | Vancouver, BC | 2020

(Dialog 2020)

International MURB Example

Image 2: The Valley | Amsterdam, The Netherlands | 2022



(MVRDV 2022)

Methods

The study identified sixty-five award-winning housing projects using specific inclusion criteria. To be included in the study, projects needed to be: built (not under construction); purpose-built as MURB (not adaptive reuse, renovations or conversions); constructed since 2000; more than two stories high; awarded an architectural design award; and published in English with sufficient information about IEQ available including building and unit floorplans. The study did not consider hotels, student dormitories, or institutional housing. The study took place in the Summer of 2023 and considered projects with published information available in English within the time frame of this study. The study documented and compared details and strategies about architectural design using building floor plans, unit floor plans, architectural award information, including the name of the award and the criteria for judging, and published information about building performance focused on IEQ. Graphic comparisons and measurements of floorplans, building plans, elevations and sections were used to understand the specific design strategies.

Scan to see the MURB Database!

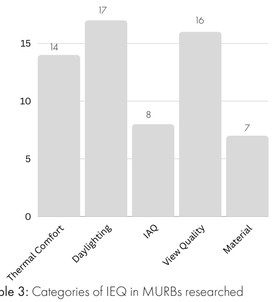


Table 3: Categories of IEQ in MURBs researched

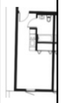
No.	Exterior Photo	Building | Architect | Location	Built Year	Type of Housing	Building Plan	Link(s)	Unit Plan	Award(s)	Category	Status of Building when Awarded	IEQ Categ
	Building Information				**Architectural Design**			**Achievement**			**(IE**
1		Albion Riverside | Sir Norman Foster | London, United Kingdom	2003			https://albionriverside.com/building.htm		Wandsworth Design Award | 2016	Positive Contribution	After Built | Unique	View Quali
2		VM Houses | BIG + JDS | Copenhagen, Denmark	2005	Market Housing		https://www.archdaily.com/970/vm-houses-plot-big-jds		Forum AID 2006	Best Building	After Built	Air Quality
3		The Wave | Henning Larsen Architects | Vejle, Denmark	2017	Market Housing		https://henninglarsen.com/en/projects/0700-0799/0741-the-wave-in-vejle/		ABB Leaf Award | 2012	Innovative Architect	Design Stage	Daylightin
4		Via 57 West | Bjarke Ingels Group | New York, USA	2016	Market Housing		https://big.dk/projects/via-57-west-2350		AIA Awards | 2017	National	After Built	Daylightin
5		Star Apartments | Michael Maltzan Architecture | Los Angeles, US	2014	Social Housing		https://www.mmaltzan.com/projects/star-apartments/		AIA Award | 2015	Architecture Design Honor	After Built	Daylightin
6		Cloverdale749 | Lorcan O'Herlihy Architects | Los Angeles, California	2015	Market Housing		https://loharchitects.com/work/cloverdale749		AIA Award | 2018	Housing	After Built	Daylightin
7		The Six | Brooks + Scarpa | Los Angeles, California	2016	Affordable Housing		https://brooksscarpa.com/the-six		AIA Award | 2017	Specialized Housing	After Built	Daylightin

Table 4: Piece of the database from the summer research

Results

The building data results were analyzed, and findings were organized around several successful design strategies used in award-winning MURB. At building scale, the best examples employed one or more of the following four strategies: narrow building forms, low and medium rise height, single loaded corridors, and stepped building forms. These strategies impacted the unit scale, improving daylight access and providing the potential for natural ventilation. For each of these four strategies, a few sample projects were analyzed in more detail, with specific building aspects identified and a discussion of how the award-winning criteria interacted with IEQ.

Discussion

For each of the four design strategies, the discussion section explores the barriers or disincentives to building these in the Canadian context. The first strategy identified in the buildings studied, a narrow building form or footprint, offered significant benefits for IEQ. Unlike deep, rectilinear forms, which may result in dark areas within units, narrow footprints provide advantageous unit aspect ratios and the potential for natural ventilation. This strategy is often complicated to employ in the Canadian context, due to a competing goal of maximizing unit numbers on a floorplate and compliance with exit stair requirements. Therefore, more significant development sites tend to be used for MURB in urban Canadian contexts, which does not easily allow narrower forms. Examples identified in this study include Collins Street Housing in Melbourne by Bates Smart Architects, winner of the CTBUH Award in 2021 for Construction Excellence.

The second strategy identified in the study is mid-rise height. While taller residential buildings are typical in urban centers globally to facilitate density, in this study of architectural quality, it was found that most award-winning buildings were mid-rise. There could be many reasons for this finding. Still, regarding IEQ, there are benefits to mid-rise housing, such as possibilities for natural ventilation, daylight, and larger units. It could also be that designs for high-density tall buildings may need to be entering design competitions. In the Canadian context, many new housing developments are high-rise, to maximize the number of units on the site with repeating floorplates. Examples identified in this study include Maison New Farm in Australia by Graya and Joe Adsett Architects, winner of the Brisbane Housing and Construction Awards 2023 (Joe Adsett Architects 2023).

The third strategy identified in this study is the use of single-loaded corridors as a means of circulating and entering the units. Light and air from both sides of the buildings increase residents' privacy, daylight exposure, and natural ventilation. While double-loaded corridors may enable more units and greater density, there are no IEQ benefits, only drawbacks. Double-loaded corridors are far less common in award-winning MURB because they appear designed for efficiency rather than resident experience. Examples identified in this study of single-loaded corridors include Jonas housing in Amsterdam by Orange Architects, winner of the BNA Award for Best Building from the Royal Institute of Dutch Architects (Orange Architects 2023).

The fourth strategy identified in this study is stepped building form, as observed in many award-winning MURBs. The design of the building with varying heights can increase access to daylight, and create more 'corner' units. Examples identified in this study include the Mountain Dwellings in Copenhagen by BIG, winner of the World Architecture Festival, for their stepped form, providing private terraces with access to natural light (Canadian Award 2008).

Conclusion

In summary, we identified several award-winning MURBs in this study, showing various building and unit layout designs. Designs focused on architectural quality used narrow building forms, low and medium-rise heights, single-loaded corridors, and stepped building forms to create high levels of IEQ. These design decisions allowed for access to daylight and natural ventilation. Economic constraints are a significant barrier in the Canadian context, and many MURBs focus on maximizing unit numbers. This study briefly discussed how the four strategies can be applied in the Canadian context. Still, more work must be done to examine IEQ standards, safety regulations, local planning, and related requirements.

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