Evaluating Visual Privacy in Urban Apartment Housing

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Introduction: In urban apartment housing, design decisions relating to building massing, choice of materials, unit floorplans, and balcony design, are some of the considerations that must be evaluated for their impact on numerous performance factors. Holistic building performance includes indoor environmental quality, resident comfort, and especially in urban housing, views and visual privacy.

Background: Certain design decisions and features in apartment designs support visual privacy and enable quality views from dwellings, and new simulation tools are increasingly able to parameterize and quantify these aspects. For example, ClimateStudio, a plug-in for Rhino, has View Analysis as a performance criteria relating to the LEED rating system's View Quality Credit in the Indoor Environmental Quality (IEQ) category. View Quality is currently understudied in the context of apartment housing and there is a related area that needs investigating: visual privacy. There is a research gap relating to evaluating visual privacy and visual connectedness and it is especially relevant in urban apartment housing. This paper reports on a project that reviewed the literature on visual privacy and explored how it can be evaluated in multi-unit residential housing.

Methods: This paper reviewed relevant green building rating standards and environmental simulation tools relevant to the analysis of visual privacy. Based on this, a number of specific visual privacy challenges for urban apartment housing were identified. Case studies were selected to observe and test specific visual privacy relationships and draw conclusions about how existing standards and research would apply to these contexts. The goal of the project was to develop a researched set of visual privacy considerations relevant to this building type. Results and Discussion: Following a thematic review of published literature on visual privacy, a survey of relevant environmental simulation tools was conducted specifically focused on visual privacy and indoor environmental quality. Three main visual privacy challenges relevant to urban apartment housing were examined: facade to street relationships, balcony design including balustrade and views in and across facades, and views from building to building from windows. Observations from selected housing case studies provided examples of how residents are mitigating these visual privacy challenges and these were categorized as buffer spaces, vegetation, shades and materials. The findings of this study were contextualized within current standards and tools for visual privacy as well as within a larger discussion of related indoor environmental quality parameters. The discussion section of this paper explores a proposed framework for evaluating visual privacy specific to this building type. Conclusions: This paper highlights an important and understudied area of research in building performance in apartment housing, and summarizes the main published literature to date on visual privacy. A typology-specific framework for evaluating visual privacy is proposed, and future work in this area is suggested.

Keywords: visual privacy, indoor environmental quality, building performance, housing design

VISUAL PRIVACY CONSIDERATIONS IN MURBS

Evaluating Visual Privacy as part of Indoor Environmental Quality (IEQ) in Urban Apartment Housing

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Introduction

In urban apartment housing, numerous design considerations must be evaluated for their impact on resident comfort and building performance. As the building industry increases guidelines and standards for green building design and construction, the influence of occupant behaviour, and the ways that people use the buildings becomes increasingly impactful when considering operational resource use. This study focused on high rise high density housing, and argues for visual privacy's inclusion as a part of IEQ discussions. The starting point of the study is the assertion that resident quality of life in high density housing is closely linked to their experience of comfort. With increasing urban density, all aspects of indoor environmental quality, including view quality, and visual privacy must be given more consideration as they contribute to comfort and wellbeing.

Background

Researchers have studied privacy and housing from various perspectives, and privacy is considered as part of indoor environmental quality in some papers on workplace satisfaction (Franke and Nadler 2021; Bae, Martin, and Asojo, 2020). In housing, visual privacy is often reported as an issue by residents. A recent systematic review by Brazilian architectural researchers de Macedo, Ornstein, and Elali (2022) found that studies largely focus on physical, psychological and social dimensions of the phenomenon, and no mention is made of attempts to quantify or develop metrics to make visual privacy a design or performance parameter. In housing design and building science research, there are few papers but some new tools that relate to view and privacy. Certain design decisions and features in apartment designs support visual privacy and enable quality views from dwellings, and new simulation tools are increasingly able to parameterize and quantify these aspects. For example, ClimateStudio, a plug-in for Rhino, has View Analysis as a performance criteria relating to the LEED rating system's View Quality Credit in the Indoor Environmental Quality (IEQ) category (Solemma 2022). View Quality is currently understudied in the context of apartment housing (Ko et al. 2022), and in this study we noticed it is connected to strategies for visual privacy. There is a research gap relating to evaluating visual privacy and visual connectedness and these parameters impact both resident comfort and quality of life, and it needs to be further studied to see how it impacts building performance. This poster reports on some results of a larger pilot project that reviewed the literature on visual privacy, and began to investigate how it can be evaluated in multi-unit residential housing through some studies.

Methods

This poster presents selected preliminary results of a larger study. The larger study included a review of relevant green building rating standards and environmental simulation tools relevant to the analysis of visual privacy. Based on this, a number of specific visual privacy challenges for urban apartment housing were identified and tested. Four urban blocks were selected as case studies to identify and examine specific visual privacy relationships and draw conclusions about how existing standards and research would apply to these contexts. The goal of the project was to develop a researched set of visual privacy considerations relevant to this building type. In this poster, results are presented for an area of the Liberty Village neighbourhood of Toronto. For each case study, data was collected about twelve housing towers. The building floorplans were consulted,measurements were taken from 3D models of the distances to adjacent buildings, the design of the building's podium was studied, the building was visited from the outside and use of blinds and shading was observed, and the qualities of the building balconies were studied.

Results

The results of the study of a cluster of housing towers in Liberty Village, Toronto study found several visual privacy conditions. The results identified that the main building-scale visual privacy challenges as 1) issues of views from the sidewalk and street up to the housing facade; 2) privacy between adjacent between buildings sharing a podium; 3) privacy between neighbouring buildings from balconies and windows; 4) privacy from balconies and windows down to building units below.

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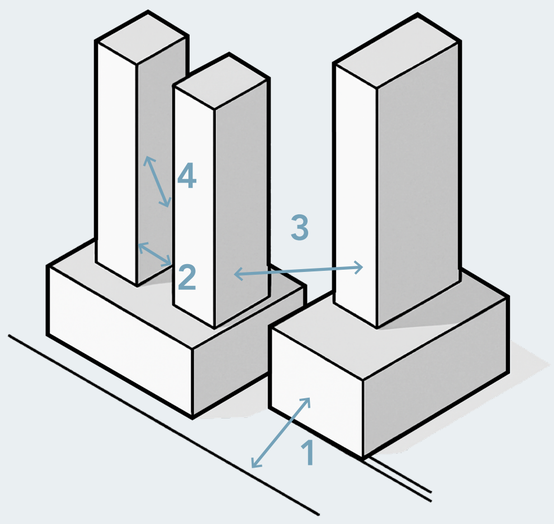

Figure 1. Diagram of identified building-scale visual privacy conditions.

Figure 2. Sample images of observation study on high-rise, visual privacy conditions.

Liberty Village							
Building	**Address**	**Distance to Adj. Building (m)**	**Podium**		**Blinds/ Shades**	**Materials**	**Balcony/ Terrace**
			Shared Podium	**If Yes, Distance to Adj. Tower (m)**			
1	50 Ordnance St	20	No		Yes	1. Glazing	Yes, inset
2	25 Ordnance St	25	Yes	20	Yes	1. Glazing	Yes, cantilevered
3	19 Western Battery Rd	25	No		Yes	1. Glazing	Yes, inset and cantilevered
4	15 Solidarity Wy	20	No		Yes	1. Glazing	Yes, inset and cantilevered
5	51 E Liberty St	23	Yes	20-25	Yes	1. Glazing	Yes, cantilevered
6	55 E Liberty St	20	Yes	50	Yes	1. Glazing	Yes, inset and cantilevered
7	59 E Liberty St	10 and 20	Yes	50	Yes	1. Glazing	Yes, cantilevered
8	65 E Liberty St	20	Yes	35	Yes	1. Windows 2. Brick	Yes, inset and cantilevered
9	69 Lynn Williams St	23	No		Yes	1. Glazing	Yes, cantilevered

Figure 3. Chart noting visual privacy characteristics of studied high-rises in Liberty Village.

Discussion

An observational study of high-rises in Liberty Village in Toronto revealed a variety of spatial strategies that both manage and complicate visual privacy and occupant comfort in high-density urban conditions. Tower-to-tower distances typically ranged from 20 to 30 metres, though in some cases were as narrow as 10 metres. Direct sightlines were managed through staggered massings and orientations, facade material choices, balcony designs, and the use of interior shading devices. While tower facades predominantly featured glazing, podium levels introduced a mix of brick and metal panel cladding, creating material contrast. Variations in balcony treatments—cantilevered versus inset, transparent versus frosted glass—offered differing degrees of enclosure and privacy. The extensive use of full-height glazing in high-rise construction requires the use of blinds, curtains, or shades to allow residents control over visibility and daylight. However, these observations prompt critical considerations on the trade-offs between expansive glazing for views versus the potential benefits of selective openings that enhance visual privacy, thermal comfort, and overall indoor environmental quality.

Conclusions & Future Directions

This poster highlights an important and understudied area of research in building performance in apartment housing relating to visual privacy. Typology-specific considerations for visual privacy are presented. This contribution is a starting point for research in this understudied area. Future directions for this research include interviewing residents to understand the quality of privacy rather than just the presence or absence of mechanisms to provide privacy. The present study was not able to conclude how visual privacy should be measured. More studies will be needed to understand visual privacy from inside the dwellings. It seems likely that rather than measuring privacy in high-rise high-density housing, there will need to be a way of measuring residents' potential to control their privacy. Also, given the nature of this kind of housing, privacy in this kind of housing will be different than privacy in offices or public buildings or even in other housing types, such as single-family housing. There is a need for further research into the role of shading devices, plan-section relationships that organize spaces separate from one another in units, and the role of buffer spaces.