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Impact of Open Void on Visitor Comfort and Safety in The Park Mall Solo's Semi-Outdoor Courtyard

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ABSTRACT

The Park Mall Solo, one of the largest commercial complexes in the Solo Raya region, incorporates a semi-outdoor courtyard intended to deliver natural lighting, ventilation, and vegetation in line with Green Building principles. In practice, however, this courtyard faces two recurring problems: water accumulation from an inadequate drainage system during the rainy season, and slip hazards caused by its ceramic flooring, both of which compromise visitor comfort and safety. This study used a qualitative descriptive method grounded in Green Building evaluation criteria, with data gathered through direct field observation, photographic documentation, interviews with mall staff and visitors, and a review of relevant literature. The analysis focused on natural and artificial lighting, ventilation and thermal comfort, and the courtyard's open void as the source of both its environmental benefits and its drainage-related risks. The findings show that while the void successfully supports daylighting and air circulation, it requires complementary design interventions—including improved drainage, permeable flooring materials, and more effective nighttime lighting—to function safely across all weather conditions. These findings offer practical design recommendations for optimizing semi-outdoor courtyard spaces in commercial buildings, supporting more comfortable, safe, and environmentally sustainable public spaces for mall visitors.

KEYWORDS

Green building
Semi-outdoor courtyard
Shopping mall
Visitor comfort and safety
Drainage design

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1. Introduction

Urban population growth has increased demand for public facilities, and shopping malls have responded by expanding beyond their original commercial function into spaces for social and recreational activity (Beddington 1982; Lynda and Wing 2005). As public spaces, malls are expected to be aesthetically pleasing, functional, comfortable, and safe, with environmental quality now recognized as a key driver of visitor satisfaction and commercial success (Calori and Vanden-Eynden 2015; Rubenstein 1978).

One response to this expanded expectation, particularly where urban land is limited, has been the integration of semi-outdoor spaces into commercial buildings—areas that bring natural elements such as vegetation, ventilation, and daylighting directly into the built environment, improving environmental quality while reducing energy consumption (Madhumita 2008; Chua and Oh 2011). This approach aligns closely with Green Building principles, which frame sustainability and user wellbeing as design priorities rather than secondary considerations (Green Building Council Indonesia [GBCI] 2013).

The Park Mall Solo applies this concept through a semi-outdoor courtyard on the western side of the building, combining vegetation, seating, and an open void to admit natural light and air. In practice, however, this design carries real trade-offs. The same void that enables daylighting and ventilation also allows rainwater to enter the space, accumulating on the floor during the rainy season and pointing to an inadequate drainage system; meanwhile, the courtyard's ceramic flooring becomes slippery once wet, raising a safety risk that is particularly acute for children and elderly visitors. Both issues directly undermine comfort and safety, which are themselves core measures of public space quality (Karyono, 2010).

Despite the growing use of semi-outdoor courtyards in commercial buildings, research evaluating their actual performance—how well they deliver on comfort, safety, and sustainability once built, rather than as design intentions alone—remains limited. This gap is precisely where this study is positioned: it sets out to identify the specific design issues present in The Park Mall Solo's semi-outdoor courtyard, and to propose improvements grounded in Green Building principles that address both its drainage-related comfort problems and its flooring-related safety risks, without compromising the natural lighting and ventilation that make the space valuable in the first place.

Addressing these issues is expected to yield more than a single-site fix. By working through this courtyard as a case study, this research aims to produce design guidance that is transferable to other semi-outdoor commercial spaces facing similar weather-related trade-offs—offering mall managers and interior designers a concrete reference for how Green Building principles can be applied not only at the planning stage, but as a corrective framework for spaces already built, ultimately supporting public environments that are comfortable, safe, and environmentally sustainable for the communities that use them.

2. Method

Research can broadly defined as a ystematic investigation undertaken to examine a problem until it is resolved (Soeratno 2008), through the organized collection and analysis of data needed to produce reliable conclusions (Andriani 2013)—a process that moves through problem formulation, data collection, data management, and analysis to build scientific knowledge (Supranto 1997). A research method, in turn, is the systematic approach used to pursue that goal (Pasaribu and Simanjuntak 1983), understood as the working process through which a research object or subject is investigated to produce scientifically justifiable answers (Ruslan 2003) and, ultimately, as the primary means by which a researcher reaches a given objective (Muhadjir 2000).

This study adopts a qualitative approach, consistent with its aim of understanding social and cultural phenomena in depth through observation, interviews, and content analysis rather than numerical measurement (Syaodih 2009; Setyosari 2010; Sutopo and Arief 2010). Qualitative research of this kind is understood as an intensive, field-based investigative process that interprets documents and evidence descriptively (Erikson 1986), producing descriptive data in the form of written or spoken words and observable behavior (Bogdan and Taylor 1992) in order to explain the relationships between social facts, human behavior, and their surrounding context (Koentjaraningrat 1984).

Specifically, this research uses a qualitative descriptive method structured around Green Building evaluation criteria, applied in three stages: data collection, analysis, and comparison of findings against relevant Green Building theory. Data was collected through four methods—direct field observation of the courtyard's physical condition and surrounding context; photographic documentation used as supporting analytical material; interviews with mall employees and visitors; and a literature review gathering sources relevant to the research topic. These four data sources were then analyzed together, combining field observations with the literature review to produce an in-depth qualitative account. The analysis itself was concentrated on two Green Building dimensions most relevant to the courtyard's identified problems: natural and artificial lighting systems, and the role of vegetation in the outdoor area—evaluated specifically for their effectiveness in supporting the building's sustainability and the comfort of its visitors.

3. Results and Discussion

3.1 The Park Mall Solo and Its Green Design Approach

The Park Mall Solo, developed by PT Nirvana Development Tbk and managed by PT Tri Star Land, opened on October 31, 2013, and has since become one of the Solo Raya region's principal shopping destinations. Located at Jl. Ir. Soekarno, Dusun II, Madegondo, Grogol, Sukoharjo Regency, the mall sits at the administrative border between Solo and Sukoharjo, with a building area of 55,000 m^2 and a 22,000 m^2 parking area—a scale that places it among the region's largest commercial facilities.

Among its design features, the semi-outdoor courtyard stands out as the mall's clearest expression of Green Building principles. Vegetation, seating, and an open void work together to bring daylighting and natural ventilation directly into the space, reducing reliance on artificial lighting and air conditioning while giving visitors a markedly different atmosphere from the enclosed retail floors elsewhere in the building (Figure 1). This courtyard is where the present analysis is concentrated, since it is also where the mall's Green Building ambitions meet their most visible practical challenges.



Fig. 1. The Park Mall Solo's semi-outdoor courtyard, showing decorative lighting, vegetation, and open circulation space. (*Source: author's documentation, 2024.*)

3.2 Natural Ventilation and Thermal Comfort

The courtyard's open void performs well under normal conditions, allowing air to circulate freely and keeping the space noticeably cooler than it would be fully enclosed—one of the clearest, most consistent benefits visitors and business operators alike reported in interviews. During the rainy season, however, this same openness works against the space: humidity rises sharply, undermining thermal comfort and, according to several business owners interviewed for this study, measurably reducing foot traffic around the courtyard during wet weather. This points to a design that performs well for the majority of the year but lacks a mechanism for adapting to seasonal extremes—a gap that could plausibly be addressed with transparent canopies or supplementary ventilation calibrated specifically for the rainy season, without sacrificing the daylighting and openness that define the space the rest of the year.

3.3 Natural and Atificial Lighting

Daytime lighting in the courtyard is genuinely effective: direct sunlight through the open void produces a bright, energy-efficient atmosphere that reinforces the space's semi-outdoor character without any artificial supplementation (Figure 2). At night, the picture changes. Existing artificial lighting leaves several areas of the courtyard dimly lit (Figure 3), a shortfall that affects both visibility and the sense of safety for visitors using the space after dark. Strategic placement of additional fixtures—concentrated at the points identified as dimmest during site observation—would address this gap directly, and doing so with energy-efficient lighting would keep the improvement consistent with the courtyard's broader Green Building framing rather than working against it.



Fig. 2. Daytime natural lighting in the courtyard, showing sunlight entering through the open void. *(Source: author's documentation, 2024.)*



Fig. 3. Nighttime artificial lighting conditions in the courtyard. *(Source: author's documentation, 2024.)*

3.4 The Open Void: Benefit and Liability

The open void is simultaneously the courtyard's defining asset and its central design problem. It is directly responsible for the daylighting and ventilation documented above, but it is also the entry point for the rainwater that accumulates on the courtyard floor during the rainy season, producing puddles and drips that make the ceramic flooring genuinely hazardous underfoot (Figure 4). Warning signage and temporary water-collection measures are already in place, visible evidence that mall management is aware of and actively managing the problem—but these are stopgap responses, not a structural fix, and site observation suggests they remain insufficient to protect children and elderly visitors specifically, who are most vulnerable to a slip-and-fall incident on wet ceramic tile.



Fig. 4. Existing courtyard flooring during the rainy season, showing water collection measures (bucket) and warning signage in response to drainage issues. (*Source: author's documentation, 2024.*)

Two complementary interventions follow directly from this diagnosis. First, a transparent roof or canopy positioned to shield the floor from direct rainfall while preserving the void's daylighting function would address the problem at its source rather than managing its aftermath. Second, and independent of whether the void itself is modified, the flooring material beneath it could be replaced with a water-absorbent alternative—permeable concrete being a well-established option for semi-outdoor applications, capable of absorbing water quickly enough to prevent puddling even in sustained rain (Figure 5). Specialized installation expertise is required, but the resulting reduction in slip risk, combined with the material's compatibility with the courtyard's existing drainage challenges, makes it a stronger long-term solution than signage alone.



Fig. 5. Permeable paving material proposed as a water-absorbent alternative to the courtyard's existing ceramic flooring. (*Source: reference image.*)

3.5 Impact on Visitor Activity and Business Operations

The cumulative effect of these two problems—humidity-driven discomfort and slip-hazard flooring—is a measurable drop in how long visitors linger in the courtyard during the rainy season, directly affecting the businesses operating around it. Business owners interviewed for this study consistently linked reduced customer traffic to wet-weather conditions in the courtyard specifically, rather than to broader seasonal shopping patterns. This finding reinforces that the drainage and flooring issues identified above are not merely a visitor-comfort concern but a functioning business risk for mall tenants, which strengthens the case for prioritizing the waterproof, non-slip flooring and improved nighttime lighting discussed above as interventions with both safety and commercial justification.

4. Conclusion

This study shows that good design intent is not the same as good design performance. The Park Mall Solo's semi-outdoor courtyard succeeds at what it was built to do under normal conditions—its open void delivers genuine daylighting, natural ventilation, and a distinct recreational atmosphere that sets it apart from the enclosed retail floors elsewhere in the building. The same feature that makes this possible, however, is also the source of its two most pressing problems: an inadequate drainage system that lets rainwater accumulate on the courtyard floor, and ceramic flooring that becomes genuinely hazardous once wet, placing children and elderly visitors most directly at risk.

These findings matter beyond this single site. In a dense urban context like Surakarta, where land is limited and buildings increasingly turn to semi-outdoor spaces to bring natural elements into commercial architecture, a courtyard like this one represents a broader design pattern, not an isolated case—which means its failure points are instructive well beyond The Park Mall itself. Addressing them does not require abandoning the open void or the Green Building principles behind it; it requires completing the design logic those principles started. Improved drainage, water-absorbent flooring materials such as permeable concrete, and better-placed nighttime lighting are not compromises to the courtyard's natural-design identity—they are what allow that identity to function safely and comfortably across every season, not just the dry ones.

Ultimately, this study reinforces that public space quality cannot be judged by its best-case conditions alone. A space that performs well on a clear day but creates real safety risk during the rainy season has not fully met the comfort and safety standards expected of public commercial facilities. Closing that gap would not only protect Park Mall Solo's visitors and support the businesses operating around the courtyard, but would also offer a transferable model for how other semi-outdoor commercial spaces can apply Green Building principles as a complete design discipline—one that accounts for a building's full range of weather conditions, not just its most favorable ones.

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