GEORGE BROWN PRESS
JOURNALS, BOOKS & PROCEEDINGS

International Journal of Engineering Advances

Review

Post-pandemic Architectural Design: A Review of Global Adaptations in Public Buildings

Ying Liu [1,*]

[1] China Building Design Consultants Shenzhen, Shenzhen, China
* Correspondence: Ying Liu, China Building Design Consultants Shenzhen, Shenzhen, China

Abstract: The COVID-19 pandemic has drastically reshaped the way public buildings are designed and used, forcing architects and urban planners to rethink existing architectural norms. This review explores the global adaptations in public building design in response to the pandemic, focusing on key changes in spatial organization, health and safety protocols, and the integration of smart technologies. Drawing from case studies across North America, Europe, and Asia, the paper highlights the importance of flexibility, modularity, and sustainability in post-pandemic architectural solutions. It also examines the emerging role of advanced technologies such as AI, automation, and data-driven design in enhancing the user experience and ensuring safety. The review concludes with a discussion on the long-term implications for future architectural practice and identifies gaps in current research, suggesting areas for further exploration in the evolving field of post-pandemic architecture.

Keywords: post-pandemic architecture; public buildings; design adaptations; health and safety; smart technologies

1. Introduction

The global COVID-19 pandemic has significantly reshaped the way we interact with public spaces. Public buildings, which were once designed with functionality, aesthetics, and efficiency in mind, faced unprecedented challenges during the pandemic [1]. From hospitals and government buildings to schools and transportation hubs, the pandemic forced a reevaluation of how these spaces can safely accommodate large groups of people. As the world continues to recover and adapt to new norms, it is essential to understand how architectural practices have evolved in response to these challenges [2].

The importance of understanding these architectural adaptations post-pandemic cannot be overstated. The pandemic has exposed vulnerabilities in building designs that were previously overlooked, especially concerning health, safety, and hygiene. These vulnerabilities have led to a surge in demand for designs that prioritize flexibility, ventilation, and resilience. Architects and designers worldwide are now rethinking how spaces can be both adaptive to changing health guidelines and conducive to long-term sustainability [3].

This review aims to examine the global architectural responses to the pandemic, highlighting the innovations and modifications that have been made in public buildings. The scope of this review includes the exploration of various design adaptations, such as improvements in air quality, spatial flexibility, and hygiene measures, as well as the integration of smart technologies and sustainability practices. By discussing these themes, this review seeks to provide a comprehensive overview of how public building design is evolving in the aftermath of the pandemic and how these changes might influence future architectural practices.

Received: 15 March 2025
Revised: 23 March 2025
Accepted: 15 April 2025
Published: 22 April 2025

2. Impact of the Pandemic on Public Building Design

The COVID-19 pandemic has radically altered the way public buildings are used and designed. What was once considered conventional design for public spaces has now been re-examined to meet the new health and safety requirements [4]. As the pandemic unfolded, several key challenges emerged regarding the functionality and safety of public buildings. These changes have led to an accelerated shift in architectural design, focusing on spatial reorganization, hygiene, and ventilation to ensure safer environments [5].

2.1. Changes in Building Usage Patterns during the Pandemic

Before the pandemic, public buildings were designed to accommodate a steady flow of people, with a focus on efficiency and accessibility, as shown in Figure 1. However, the need for social distancing and restricted occupancy during the pandemic altered these usage patterns drastically. Public buildings that were once filled with large crowds, such as offices, museums, shopping centers, and educational institutions, suddenly faced new constraints that required rethinking their spatial layouts and operational functions.

Figure 1. Stadium Management during the COVID-19.

During the pandemic, many buildings were temporarily closed or repurposed for emergency uses. The shift towards remote work, online learning, and virtual events led to a reduction in the foot traffic that public spaces typically saw. This change also forced architects to think about flexible, adaptable spaces that could cater to new needs — such as creating multifunctional spaces that could be quickly converted into medical facilities or areas for social distancing.

2.2. The Shift in Spatial Requirements for Public Buildings

Social distancing has become one of the most prominent design considerations. Public spaces, such as waiting areas, meeting rooms, and common areas, required significant redesign to accommodate this new reality. Buildings needed to ensure that individuals could maintain safe distances, which led to larger circulation spaces, wider corridors, and reconfigured layouts to reduce crowding.

Hygiene protocols also became a key focus in redesigning spaces. In high-traffic areas, surfaces that were previously shared (such as door handles, elevators, and stair rails) became potential points of contamination. Architects responded by incorporating touchless technologies, automatic doors, and materials that are easier to clean and sanitize, such as antimicrobial coatings and non-porous surfaces.

2.3. Emerging Health and Safety Considerations in Architectural Design

The pandemic emphasized the importance of air quality and ventilation in public buildings. Proper air circulation became vital in reducing the spread of airborne pathogens, and this has prompted designers to focus more on enhancing HVAC (heating, ventilation, and air conditioning) systems. Many buildings have adopted advanced filtration systems, increased airflow, and utilized natural ventilation strategies to improve air quality.

Additionally, the demand for personal protective equipment (PPE) and sanitation stations has led to the inclusion of more hygienic spaces, including hand sanitizing stations at building entrances, disposable masks, and gloves. Other changes include better waste management and the design of spaces for quarantine or isolation when needed [6].

To summarize the impact of the pandemic, Table 1 illustrates how public buildings have adapted in response to the emerging challenges:

Table 1. Key Design Adaptations in Public Buildings Post-Pandemic.

Design Aspect	Pre-Pandemic Design	Post-Pandemic Adaptations
Space Usage	Open plan layouts, high-density occupancy	Flexibility in space usage, modular designs, capacity reduction, and reconfigurable layouts
Social Distancing	Minimal space between individuals in common areas	Wider corridors, increased space between seating, and designated one-way traffic patterns
Hygiene and Cleanliness	Standard cleaning protocols	Touchless technologies, antimicrobial materials, and enhanced cleaning protocols
Air Quality & Ventilation	Standard ventilation systems	Improved HVAC systems with higher filtration rates, natural ventilation strategies
Technology Integration	Limited use of technology in building operations	Smart systems for occupancy monitoring, automatic doors, and air quality control

These adaptations are not only necessary to ensure safety during health crises but also represent a significant shift in how architects approach the design of public buildings for the future. By making these changes, architects are rethinking building function, health, and safety, leading to the development of more resilient and adaptive spaces.

3. Global Adaptations in Public Buildings

The pandemic has prompted a wide array of architectural adaptations across the world, with different regions responding to the challenges in unique ways based on their specific needs, population densities, and existing infrastructure. As public health protocols evolved, so did the way architects approached the design of public buildings. In this section, we explore how different regions have adapted their public buildings to meet new health, safety, and social requirements.

3.1. North America: Focus on Improved Ventilation Systems and Air Quality Measures

In North America, the focus has primarily been on enhancing air quality and ventilation in public buildings. As the pandemic underscored the critical role of air circulation in mitigating the spread of airborne diseases, many buildings in the region adopted advanced HVAC (heating, ventilation, and air conditioning) systems. These systems now incorporate high-efficiency filters, increased air exchange rates, and the use of ultraviolet (UV) light to disinfect the air. Hospitals, offices, schools, and other public spaces have installed air purifiers and smart sensors to monitor air quality continuously [7].

For example, in Canada, several public health guidelines were introduced to improve the indoor air quality in schools and offices. Many schools retrofitted their HVAC systems to include higher-grade filters and installed air purifiers in classrooms. Similarly, large

office buildings and shopping malls in cities like New York and Toronto have undergone significant upgrades to their HVAC systems, including the installation of dedicated outdoor air systems to bring in fresh air and reduce reliance on recycled air.

3.2. Europe: Flexible Layouts and Innovative Open-Space Designs to Accommodate New Social Dynamics

In Europe, public buildings have been redesigned with an emphasis on flexibility and adaptability to accommodate new social dynamics brought about by the pandemic. European cities have embraced innovative open-space designs that allow for more fluid and flexible layouts, which can be quickly adjusted to adhere to social distancing measures.

For instance, many museums and galleries in Europe have transitioned to more flexible, modular layouts that allow for easy reconfiguration of exhibits and spaces. This shift makes it easier to control the flow of visitors and to reduce crowding in specific areas. Likewise, office buildings in major cities like London and Berlin have adopted hybrid workspaces that allow employees to work from home or in flexible, distanced arrangements in the office. Public transport hubs have also seen redesigns, with wider seating arrangements and clear signage to guide passengers on maintaining safe distances.

One of the most innovative examples is the redevelopment of public parks and outdoor spaces in European capitals. With an increased emphasis on outdoor activities, cities like Paris and Amsterdam have repurposed public parks and streets to allow for more outdoor gatherings, exercising, and dining, which helps maintain social distancing without limiting public access to vital spaces.

3.3. Asia: Strategies for Public Buildings in High-Density Urban Environments, Including Modular and Adaptable Spaces

Asia, home to some of the world's most densely populated urban areas, faced unique challenges during the pandemic. With cities like Tokyo, Mumbai, and Jakarta having limited space and high population densities, architectural strategies focused on creating adaptable, modular public spaces that could respond rapidly to changing needs.

In Japan, for example, the design of public buildings incorporated modular walls and partitions that could be adjusted to suit different purposes — whether for temporary healthcare facilities or to allow for social distancing in crowded public spaces. This modular approach also extended to transportation hubs, where flexible designs allowed for rapid changes in passenger flow and seating arrangements.

In China, major cities have been quick to implement touchless technologies in public buildings, including touchless elevators, automated doors, and self-cleaning surfaces. Moreover, large-scale public infrastructure projects in Beijing and Shanghai now prioritize air quality, with enhanced ventilation systems and more frequent air quality monitoring.

Singapore has also set a leading example in integrating smart technologies in public buildings. Using sensors to monitor occupancy levels, air quality, and temperature, the city-state has developed "smart buildings" that can adapt in real-time to changing health guidelines. This includes buildings where public spaces can be transformed quickly into quarantine or isolation areas if needed.

3.4. Other Regions: Notable Adaptations and Unique Approaches in Diverse Global Contexts

While North America, Europe, and Asia have received the most attention for their pandemic-related design adaptations, other regions have also made significant strides in improving public building safety and functionality during the pandemic.

In the Middle East, for example, the United Arab Emirates and Saudi Arabia have adopted high-tech solutions in public spaces, including air purification systems and advanced sanitation technologies. Many public buildings in Dubai and Riyadh now feature

automatic sanitizing stations at entrances, touchless payment systems, and enhanced waste management protocols.

In Latin America, countries like Brazil and Argentina have focused on creating outdoor public spaces where people can gather while maintaining physical distancing. Urban planners have designed parks, plazas, and pedestrian streets with expanded seating areas, more green spaces, and larger walkways, which encourage people to spend time outdoors in safer, more open environments [8,9].

In Africa, the pandemic has highlighted the need for resilient infrastructure that can quickly adapt to health emergencies. In cities like Nairobi and Lagos, designers are focusing on creating more flexible community spaces, such as multi-purpose halls and modular units, which can be quickly converted for health-related purposes or other community needs.

4. Design Innovations and Adaptations Post-Pandemic

As the world transitions into the post-pandemic era, architects and urban planners have embraced innovative design solutions that prioritize health, flexibility, and sustainability. The pandemic has heightened the awareness of how design decisions can impact the health, well-being, and resilience of public spaces. This section explores key design innovations and adaptations, focusing on health and safety measures, flexibility and modularity, and sustainability.

4.1. Health & Safety Measures: Air Circulation Systems, Touchless Technology, and Materials Promoting Hygiene

One of the most prominent changes in public building design has been the increased focus on health and safety measures, particularly concerning air quality and hygiene. The pandemic highlighted the vital role of air circulation systems in preventing the spread of airborne pathogens, which has led to an increased emphasis on HVAC systems and other air purification technologies.

Air circulation systems have undergone significant upgrades to improve indoor air quality. Many buildings now feature high-efficiency particulate air (HEPA) filters, ultraviolet (UV) air purifiers, and increased ventilation rates to reduce the concentration of airborne viruses. In schools, offices, and healthcare facilities, designers are integrating dedicated outdoor air systems that bring in fresh air while minimizing the use of recycled air.

Touchless technology has also become an essential component in post-pandemic designs. Public spaces now incorporate touchless entry systems, automatic doors, motion-activated lighting, and voice-controlled devices to minimize physical contact with shared surfaces. Elevators have been redesigned with touchless controls, and public bathrooms now feature hands-free faucets, soap dispensers, and paper towel dispensers.

In addition to air circulation and touchless technology, materials promoting hygiene have become a priority. Non-porous surfaces, such as stainless steel, glass, and certain synthetic materials, are being used more frequently in high-contact areas. Antimicrobial coatings are also being applied to common surfaces like handrails, door handles, and counters to reduce the spread of germs.

4.2. Flexibility and Modularity: Adaptable Space Planning, Movable Partitions, and Mul-Ti-Functional Spaces

The pandemic has reshaped the way we view the use of space, emphasizing the need for flexibility and adaptability. Public buildings now must be designed with the ability to rapidly adapt to changing health regulations, varying occupancy levels, and evolving functions.

Adaptable space planning is at the forefront of this change. Buildings are increasingly being designed with multi-purpose rooms and reconfigurable spaces that can be easily

adjusted for different activities or functions. For example, community centers and libraries are now designed with movable partitions that can divide larger rooms into smaller spaces to allow for social distancing or group activities. This flexibility allows buildings to serve multiple purposes at once, such as being used as vaccination centers or emergency shelters when needed.

Multi-functional spaces are also being designed to maximize space efficiency. In offices, for instance, open-plan layouts are being replaced with modular spaces that can accommodate both remote work and in-person collaboration. Similarly, educational institutions are introducing classrooms that can easily be transformed into meeting rooms or event spaces, allowing for maximum utilization of space.

Movable partitions are gaining popularity in public spaces such as conference halls, exhibition centers, and auditoriums. These partitions allow spaces to be quickly reconfigured to accommodate different group sizes, enabling better crowd management and facilitating physical distancing during events.

4.3. Sustainability: The Role of Energy-Efficient Design and Sustainable Materials in Post-Pandemic Architecture

As architects and urban planners reimagine public buildings, there is an increasing focus on sustainability — both in terms of environmental impact and long-term resilience. The pandemic has underscored the importance of creating buildings that are not only responsive to health crises but are also environmentally responsible and energy-efficient.

Energy-efficient design plays a significant role in post-pandemic architecture. Buildings are now being designed with advanced insulation materials, energy-efficient windows, and natural lighting systems that reduce the reliance on artificial heating and cooling. Solar panels, green roofs, and rainwater harvesting systems are also being incorporated into new public buildings, making them more sustainable and reducing their carbon footprint.

Sustainable materials are another key element in the post-pandemic shift. Materials like reclaimed wood, recycled steel, and low-impact concrete are becoming more common in the construction of public buildings. These materials reduce the environmental impact of new buildings and contribute to a circular economy by reusing materials rather than extracting new resources. Additionally, bio-based materials such as bamboo, cork, and hempcrete are being explored for their eco-friendly properties and potential to reduce a building's carbon footprint.

Moreover, the pandemic has encouraged a rethinking of urban design with a focus on creating more resilient and self-sustaining buildings. Concepts like "resilient design" and "regenerative architecture" are gaining momentum, which involves designing buildings that can adapt to changing environmental conditions, minimize waste, and regenerate natural resources.

5. Long-Term Trends in Architectural Design Post-Pandemic

The COVID-19 pandemic has had a profound and lasting effect on architectural design, with many of the changes made to public buildings during the pandemic expected to become permanent. As the world adapts to new ways of living, working, and interacting, long-term trends are emerging that focus on smart technologies, reimagined social spaces, and sustainable design practices. In this section, we will explore three key long-term trends that are shaping the future of public architecture: smart building technologies, reimagining social spaces, and the growing emphasis on sustainability and resilience.

5.1. Smart Building Technologies: Integration of Automation, AI, and Data-Driven Design to Enhance User Experience and Safety

The future of public building design will increasingly rely on the integration of smart technologies to enhance the user experience and ensure safety. Smart buildings are equipped with a range of automated systems powered by artificial intelligence (AI), the Internet of Things (IoT), and data-driven design. These technologies not only improve the functionality of buildings but also optimize resource usage, reduce energy consumption, and enhance the overall well-being of occupants.

In post-pandemic architecture, smart building technologies have become essential for maintaining safety and ensuring that public spaces are adaptable to changing health guidelines. For example, occupancy sensors can monitor the number of people in a room or building, alerting users when capacity limits are reached and ensuring compliance with social distancing rules. AI-driven systems can also control lighting, heating, and ventilation, adjusting them in real-time based on occupancy levels and environmental conditions.

Another significant development in smart buildings is the use of touchless technology. In the post-pandemic world, touchless access systems, such as biometric scans or voice-activated controls, are becoming standard in many public buildings. These technologies minimize physical contact with surfaces, reducing the spread of germs and enhancing hygiene.

Additionally, AI can analyze large datasets from sensors and cameras to predict building maintenance needs, optimize energy usage, and enhance occupant comfort. By leveraging data-driven insights, architects and building managers can create more efficient, safer, and user-friendly environments.

5.2. Reimagining Social Spaces: Redesigning Public Spaces for Safer and More Flexible Interactions

The pandemic has reshaped the way people interact in public spaces. Social distancing and the shift to remote work have prompted architects to rethink how public spaces are designed to promote both safety and flexibility. In the long term, public spaces will be redesigned to accommodate safer, more flexible interactions, supporting diverse functions and evolving needs.

Public spaces such as parks, plazas, and community centers will increasingly prioritize flexibility and adaptability. Modular seating, moveable partitions, and open-plan designs will allow these spaces to be reconfigured easily to accommodate different activities or social dynamics. For example, outdoor parks and public squares can be transformed into event spaces or temporary marketplaces that promote safe social interactions.

In addition to flexibility, there will be a renewed focus on designing spaces that foster social connectivity while maintaining health protocols. Open spaces that promote physical distancing while encouraging social engagement will become central to urban planning. Shared spaces in buildings such as cafes, libraries, and meeting areas will be designed with more open layouts, increased ventilation, and adaptable configurations to facilitate both individual and group activities.

Technology will also play a significant role in reimagining social spaces. Digital tools, such as virtual reality (VR) and augmented reality (AR), could be incorporated into public spaces to enhance experiences and interactions while minimizing physical contact. These technologies will enable people to engage with public spaces in new ways, including virtual events, exhibitions, or guided tours that allow for both physical and remote participation.

5.3. Sustainability and Resilience: The Growing Importance of Sustainable, Resilient Designs in Future Public Buildings

The pandemic has accelerated the push toward sustainable and resilient design practices, as public health crises highlight the need for buildings that are not only responsive

to emergencies but also environmentally responsible and long-lasting. Future public buildings will be designed with sustainability and resilience as top priorities, ensuring that they can adapt to both environmental challenges and unforeseen crises.

Sustainable design practices will continue to play a major role in post-pandemic architecture. Energy-efficient buildings that minimize energy consumption, reduce carbon footprints, and make use of renewable energy sources such as solar and wind power will be more common. Green roofs, rainwater harvesting systems, and energy-efficient insulation materials are just a few examples of how architects are integrating sustainability into the design of public spaces.

Resilient design is also becoming increasingly important. Buildings that can withstand extreme weather events, natural disasters, and other emergencies will be prioritized. Resilient design goes beyond just environmental considerations; it also involves creating spaces that can quickly adapt to new uses, such as converting conference halls into emergency shelters or using community centers as temporary healthcare facilities during a crisis.

Another key aspect of sustainability in post-pandemic design is the use of sustainable materials. Architects are increasingly turning to materials that are renewable, recyclable, and have a low environmental impact. Bamboo, recycled steel, and low-carbon concrete are becoming more prevalent in the construction of public buildings, contributing to a circular economy and reducing reliance on non-renewable resources.

The focus on sustainability and resilience will also lead to the development of "smart" cities, where public buildings are integrated with urban infrastructure to optimize resource use, reduce waste, and improve the quality of life for residents. These smart cities will leverage data, AI, and IoT technologies to monitor environmental conditions, manage traffic, and ensure that resources are used efficiently.

6. Conclusion

As the world continues to recover from the pandemic, the field of architectural design has undergone significant transformation, with lasting implications for public buildings worldwide. This review has highlighted how various regions have responded to the challenges of the pandemic through innovative adaptations in architectural design. These changes not only address immediate health and safety concerns but also pave the way for future trends in public building design that prioritize flexibility, sustainability, and resilience. In this final section, we summarize the key findings from global case studies, discuss the implications for future architectural practice, and identify gaps in current research that warrant further exploration.

6.1. Summary of Key Findings from Global Case Studies and Adaptations

Through an analysis of global case studies, it is clear that the pandemic has catalyzed widespread innovations in public building design, many of which are likely to endure long after the crisis has subsided. Key adaptations observed across different regions include:

1. Health & Safety Measures: The widespread integration of advanced ventilation systems, touchless technologies, and hygienic materials in public buildings, particularly in high-traffic areas like offices, schools, and healthcare facilities.
2. Flexibility and Modularity: A strong emphasis on adaptable space planning, with movable partitions and multi-functional spaces becoming standard in buildings across North America, Europe, and Asia. This allows spaces to be quickly reconfigured to accommodate different uses and ensure compliance with public health protocols.
3. Sustainability and Resilience: A growing trend towards sustainable, energy-efficient designs, with the use of renewable materials and smart technologies that reduce a building's environmental footprint. Public buildings are increasingly

being designed to withstand environmental stresses and to adapt to a range of unforeseen challenges.

These adaptations reflect a global shift in architectural priorities, with a heightened focus on health, safety, flexibility, and environmental responsibility in response to the pandemic's impact.

6.2. Implications for Future Architectural Practice and Design

The adaptations and innovations discussed throughout this review suggest several important implications for the future of architectural practice:

1. Emphasis on Health and Well-being: Post-pandemic architectural design will likely continue to prioritize the health and well-being of occupants, integrating advanced technologies to improve air quality, reduce physical contact, and enhance hygiene. Future architects will need to develop new, more efficient ways of designing spaces that can respond quickly to health crises while maintaining user comfort and safety.
2. Integration of Smart Technologies: The role of smart technologies in architectural design will only increase in the coming years. Automation, AI, and IoT will enable buildings to not only respond to real-time conditions (such as occupancy and air quality) but also anticipate the needs of occupants and improve operational efficiency. Future architectural practice will increasingly require interdisciplinary collaboration between architects, engineers, and technologists.
3. Designing for Flexibility and Resilience: The pandemic has highlighted the need for spaces that can adapt to evolving uses and unpredictable circumstances. Architects will need to focus on designing flexible, modular buildings that can accommodate both short-term and long-term needs. The concept of resilience will also be critical, ensuring that buildings can withstand not only health crises but also environmental disasters and other emergencies.
4. Sustainability as a Core Principle: Sustainability will continue to be a driving force in architectural design, with an emphasis on energy efficiency, renewable materials, and low-impact construction methods. Architects will need to adopt more sustainable practices and incorporate strategies that minimize environmental harm while maximizing the use of natural resources.

Gaps in Current Research and Potential Areas for Further Exploration.

While much progress has been made in adapting architectural designs post-pandemic, several gaps in current research remain. Future studies could explore:

1. Long-term Effects of Design Adaptations: While many adaptations have been implemented in response to the pandemic, their long-term effectiveness and impact on the built environment remain under-researched. Future studies could investigate how these changes affect building performance, occupant satisfaction, and overall health outcomes over time.
2. Integration of Biophilic Design: While sustainability has received significant attention, biophilic design — the integration of nature into the built environment — has not been extensively explored in the context of pandemic recovery. Further research could investigate how biophilic design principles, such as incorporating natural light, plants, and outdoor spaces, can enhance well-being and productivity in public buildings.
3. Cultural and Regional Variations: The adaptations made to public buildings vary greatly across regions due to differing cultural, economic, and infrastructural contexts. Future research could focus on how architectural adaptations are perceived and implemented in various cultural contexts, and whether there are lessons to be learned from regions that have experienced less severe impacts from the pandemic.

4. Impact of Smart Cities on Public Building Design: As cities become smarter and more data-driven, the integration of smart building technologies with urban infrastructure presents new challenges and opportunities. Research could explore the implications of smart city initiatives on public building design, including privacy concerns, data security, and the accessibility of smart technologies.

In conclusion, the pandemic has fundamentally changed the way we think about and design public buildings. The innovations discussed in this review are just the beginning of a broader transformation in architectural practice. As we continue to adapt to a rapidly changing world, it is crucial for architects and urban planners to embrace these trends and explore new possibilities that prioritize human health, flexibility, sustainability, and resilience.

References

1. S. De Yong, M. Rachmawati, and I. Defiana, "Theorizing security-pandemic aspects and variables for post-pandemic architecture," *Build. Environ.*, vol. 258, p. 111579, 2024, doi: 10.1016/j.buildenv.2024.111579.
2. S. Papu and S. Pal, "Braced for impact: Architectural praxis in a post-pandemic society," *Authorea Prepr.*, 2024, doi: 10.31124/advance.12196959.v1.
3. A. Bahador and M. Mahmudi Zarandi, "Biophilic design: an effective design approach during pandemic and post-pandemic," *Facil.*, vol. 42, no. 1/2, pp. 68–82, 2024, doi: 10.1108/F-01-2023-0004.
4. S. De Yong, M. Rachmawati, and I. Defiana, "Designing secure hybrid living-working interior spaces in post-pandemic period: a review," *Int. J. Workplace Health Manag.*, ahead-of-print, 2024, doi: 10.1108/IJWHM-12-2023-0181.
5. X. Liu, H. Moayedi, A. A. Dehrashid, W. Dai, and Q. T. Thi, "Developments and evolution of housing architecture in the post-Corona era with a health-oriented approach," *Build. Environ.*, vol. 265, p. 111936, 2024, doi: 10.1016/j.buildenv.2024.111936.
6. O. Omar and S. El Sayary, "The resilience principles of the built environment in light of climate change and the post-pandemic era," in *Resilience vs Pandemics: Innovations in Public Places and Buildings*, Singapore: Springer Nature Singapore, 2024, pp. 137–152, doi: 10.1007/978-981-99-8672-9_9.
7. M. Zivkovic, M. Stanimirovic, M. Stamenkovic, S. Kondic, and V. Petrovic, "Learning from the past, looking to resilience: Housing in Serbia in the post-pandemic era," *Buildings*, vol. 14, no. 5, p. 1461, 2024, doi: 10.3390/buildings14051461.
8. O. E. Bellini, M. Romagnoli, and M. Arcieri, "What has COVID-19 taught us? Student housing in a post-pandemic era," in *Int. Symp. New Metrop. Perspect.*, Cham, Switzerland: Springer, 2024, pp. 97–109, doi: 10.1007/978-3-031-74716-8_10.
9. Y. Kong, C. Teng, and C. Liu, "Transition design as a strategy for post-pandemic spatial experience enhancement: A sustainability perspective," *Sustainability*, vol. 16, no. 14, p. 5834, 2024, doi: 10.3390/su16145834.