Chapter 6

Environmental Design

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This chapter examines the evolution of Japanese architecture from early Buddhist temples and Shintō shrines to contemporary works by architects such as Tadao Ando and Kengo Kuma. It analyzes the influence of religious beliefs, environmental conditions, social structures, and foreign interactions on the built environment. It explains how principles such as flexibility, modular design, and harmony with nature consistently inform architectural practice. Additionally, the chapter explores the role of sound, emphasising how traditional elements in gardens, as well as more recent ambient music and other sounds, enhance the sensory experience of architectural space.

1 Early and Classical Periods

An exploration of Japanese architecture often begins with two foundational building types: Buddhist temples and Shintō shrines. The introduction of Buddhism from the Korean Peninsula began during the Asuka period (538-710 AD). Early temple complexes in Nara, such as

Figure 1: Hōryūji temple (founded 607 AD) in Nara is among the earliest examples of Buddhist-inspired architecture in Japan.

Hōryūji (founded in 607 AD), established an architectural vocabulary characterized by post-and-beam construction, modular planning, and extensive use of wood.[1] While these early structures drew heavily on Chinese and Korean influences, they were quickly adapted to local conditions. By 552 AD, three distinct shrine styles had emerged:

- *Taisha-zukuri*, exemplified by the main building (*honden*) at Izumo Taisha Shrine in Shimane Prefecture (Figure 2);
- *Shinmei-zukuri*, based on Nishina Shinmei Shrine in Nagano Prefecture; and,
- *Sumiyoshi-zukuri*, represented by Sumiyoshi Taisha Shrine in Osaka.[2]

These shrine styles have been reconstructed multiple times, and all remain observable today. Although generally considered to predate the introduction of Buddhism, their current forms reflect later reconstructions and preservation efforts, complicating efforts to distinguish indigenous from imported Buddhist elements. During the Asuka period, timber became the dominant building material, reflecting both an acceptance of impermanence and a practical

[1] Hideto Kishida. *Japanese Architecture*. Roche Press, 2008.

[2] Kishida, see n. 1.

Figure 2: People gather to celebrate the new year (*Hatsumōde*) at the main building of Izumo Taisha Shirne in Shimane.

emphasis on repair and rebuilding, likely influenced by frequent natural disasters such as typhoons and earthquakes. This approach contrasts sharply with Western architectural traditions, which often prioritize permanence.[3]

During the Nara (710-794 AD) and Heian (794-1185 AD) periods, architectural refinement paralleled the development of Japanese Buddhism and the imperial court culture, particularly in the capitals of Nara and later Kyoto. Court culture, which included literature, poetry, religious rituals, and aesthetics, emphasized refinement and restraint, resulting in architectural spaces that embodied these values. Interiors were typically softly lit, with space defined flexibly by sliding screens and structural intervals rather than solid walls, features that persist in traditional Japanese buildings.[4]

In the latter part of the Heian period, buildings such as Byōdō-in in Uji (Figure 3), south of Kyoto, exemplified a sensitivity to integrating architecture with the surrounding landscape. Verandas, gardens, and water features ensured that nature was an essential component of the architectural experience.

By the Kamakura period (1185-1333 AD), Zen Buddhism significantly influenced temple architecture, emphasizing simplicity and repetition. Decorative elements were minimized in favour of materials, spatial qualities, sound, texture, and shadow. In the Muromachi period (1336-1573 AD), these principles extended to domestic architecture. The development of *shoin-zukuri* (a form of residential architecture) introduced flexible interiors using tatami flooring and sliding partitions, enabling rooms to be organized according to function. Adapt-

[3]Lafcadio Hearn. *Kokoro: Hints and Echoes of Japanese Inner Life*. English. Dover Publications, 2012.

[4]Kishida, see n. 1.

Figure 3: Byōdō temple in Uji, Kyoto, first built in the Heian period.

ability, rather than fixed purpose, became a defining feature of Japanese architectural space.[5]

2 Edō period

During the Edō period (1603-1868 AD) under the Tokugawa shogunate, political stability, economic growth, and urbanization all drove architectural development. Buildings addressed practical needs such as defence and commerce, while also reflecting cultural ideals of aesthetic restraint and harmony with the natural environment. The era's strict social hierarchy, known as *shi-no-ko-sho*, divided society into samurai, farmers, artisans, and merchants, and this structure was visibly reinforced through the scale, layout, ornamentation, and access of castles, residences, townhouses, and urban planning.

Castles exemplified the combination of defensive and aesthetic considerations, featuring stone foundations, wooden structures, curved tiled roofs, and moats. Notable surviving examples include Edō Castle (now the Tokyo Imperial Palace), Osaka Castle, and Nijō Castle in Kyoto. Nijō Castle, which served as a Tokugawa residence and seat of power, is distinguished by interiors adorned with painted sliding doors (*fusuma*), ornate carvings, polished wooden floors, and formal reception halls that reflected samurai prestige.[6] Temples and shrines continued to evolve with varied designs, often using muted greys, bright red lacquer, or black finishes.

Simplicity, harmony with nature, and minimal decoration became characteristic features, particularly evident in structures throughout Kyoto and Nara, including the sub-temples of Myoshinji and Daitokuji. Urban architecture flourished. This saw the proliferation of town-

[5] Kishida, see n. 1.

[6] Kishida, see n. 1.

Figure 4: The *karesansui* (rock garden) of Zuihō-in temple at Daitokuji in Kyoto, designed by Mirei Shigemori.

houses (*machiya*) in districts across the country, including Osaka, Kyoto, Kanazawa, and the capital, Edō (modern-day Tokyo). These buildings were typically functional, with shops on the ground floor and living quarters above – a layout still observable in historic districts in cities such as Kyoto and Kanazawa today.[7]

Gardens were conceived as miniature representations of natural landscapes, underpinned by Zen aesthetics and incorporating elements such as ponds, bridges, rocks, and seasonal plants. These spaces carried spiritual and religious significance. For example, the garden at Ryōan-ji features fifteen stones, an auspicious number in Japanese culture, yet only fourteen are visible at any one time, symbolizing the impermanence of experience, incomplete perception through the use of negative space, and asymmetry.[8] At Zuihō-in, a monastery within Daitoku-ji in Kyoto, the rock garden includes stones arranged in the form of a cross, a design created by Mirei Shigemori (1896-1975) in 1961 to honour the temple's founder, Ōtomo Sōrin (1530-1587), a daimyo who converted to Christianity during a period of persecution (Figure 4). Although Shigemori did not explicitly acknowledge this symbolism, the arrangement recalls the practices of the *kakure kirishitan* ("hidden Christians") who concealed religious meanings within Japanese artefacts during two centuries of Christian persecution.[9]

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[7]Paul Haimes. "*Machizukuri* (Neighborhood Making): Collective World-Making in Traditional Japanese Neighborhoods." In: *Contemporary Aesthetics* 20 (Nov. 2022). URL: `https://contempaesthetics.org/2022/11/10/machizukuri-neighborhood-making-collective-world-making-in-traditional-japanese-neighborhoods/`.

[8]Gert J. Van Tonder and Michael J. Lyons. "Visual Perception in Japanese Rock Garden Design." In: *Axiomathes* 15 (2005), pp. 353–371.

[9]John Dougill. *In Search of Japan's Hidden Christians: A Story of Suppression, Secrecy and Survival*. Tokyo: Tuttle Publishing, 2012.

Figure 5: A replica *chashitsu* (tea-room) at Nezu Museum in Minamiaoyama, Tokyo.

Tea rooms flourished, particularly under the influence of Sen no Rikyū (1522-1591), who is credited with shaping the Japanese tea ceremony (*chanoyu*) into its present form, distinct from Chinese traditions, but with influence from both Japan's emerging domestic Zen aesthetics and — perhaps surprisingly — the Catholic eucharistic ritual, introduced to Japan during the latter years of Rikyū's life.[10] The architecture of tea rooms reflected the ceremony's emphasis on intimacy, simplicity, and ritual. Wabi-sabi aesthetics, which value rustic simplicity, imperfection, and the passage of time, were central to Rikyū's philosophy and design (Figure 5).

Rooms typically featured low entrances (*nijiriguchi*) to encourage humility, were small in size (often 4.5 tatami mats, or just over seven square meters), and included tokonoma alcoves for simple decorations such as scrolls, ink paintings, or flowers. Deliberately framed views connecting interior and exterior gardens became a recurring motif, not only in tea rooms but also in temples, shrines, and residential spaces.[11]

Wood continued as the primary construction material, providing flexibility and ease of repair, which was especially important in earthquake-prone regions. Roofs were frequently curved and tiled, and were sometimes adorned with mythical tiger-headed fish known as shachihoko.

Throughout the Edō period, castles, townhouses, temples, shrines, gardens, and tea rooms addressed various facets of daily life, political structures, and cultural and spiritual practices. Nevertheless, the stability characteristic of this era was soon to be disrupted.

3 Modernization and Western Influence

Following more than two centuries of limited international engagement, Japan confronted a rapidly industrializing global order characterized by advanced military and production tech-

[10] Dougill, see n. 9.

[11] Kishida, see n. 1.

Figure 6: Gokōmachi Church in Kyoto, designed by the office of William Vories. This is among hundreds of buildings in Japan designed by Vories and his associates.

nologies and expanding empires. The arrival of Commodore Matthew Perry and the United States Navy in the 1850s exposed the limitations of the Tokugawa shogunate's political and military systems. The Meiji Restoration of 1868 marked a pivotal turning point, after which architecture became a prominent expression of state-led modernization and a means to convey new concepts of progress and governance.[12]

By the late nineteenth century, Western architectural movements gained prominence in Japan, including the Gothic Revival (neo-Gothic) style promoted by John Ruskin and figures from the British Arts and Crafts movement. Several buildings in this style were built throughout Japan by the American architect William Vories (1880-1964) and his office (Figure 6).[13]

Neoclassical and Renaissance-style buildings also appeared. Brick construction became common, but widespread damage from the 1923 earthquake led to a shift toward reinforced concrete in urban areas. Art Nouveau and Art Deco styles influenced Japanese architecture, with the National Diet Building in Tokyo exemplifying the latter. Modernist architecture gradually emerged, influenced by the Bauhaus school and architects such as Kunio Maekawa (1905-1986) and Junzō Sakakura (1901-1969), who studied under Le Corbusier (1887-1965), noted

[12]Kishida, see n. 1.

[13]Omi Brotherhood Group. *Chronology of Vories, 1880–1964*. William Merrell Vories Library. Accessed May 12, 2026. URL: `http://vories.com/english/chronology/`.

Figure 7: The Edō Museum in Sumida, Tokyo opened in 1993 and was designed by Kiyonori Kikutake in the Metabolist style.

for his radical functionalism and frequent use of reinforced concrete.[14]

A significant figure in the late nineteenth century was British-French architect Josiah Conder (1852-1920), who was appointed by the Meiji government in 1877 as a professor of architecture at the Imperial College of Engineering (later part of the University of Tokyo). Among his students were Tōkuma Katayama (1854-1917) and Kingo Tatsuno (1854-1919), both of whom designed notable buildings in the Kanto and Kansai regions. Katayama's Kyoto National Museum (1895) exemplifies early Neo-Renaissance architecture in Japan, while Tatsuno's Tokyo Station (1914) survived the 1923 earthquake with minimal damage despite its brick construction.[15]

4 Postwar to modern and contemporary architecture

The aftermath of the Second World War left many Japanese cities devastated by bombing and fire, requiring rapid reconstruction with limited resources. Accelerated urbanization led to the construction of utilitarian buildings, with concrete becoming the dominant material. Western modernism, especially the influence of Le Corbusier and his use of concrete, played a significant role in shaping architectural practices during this period. By the 1950s, Kenzo Tange (1913-2005) emerged as a leading architect, most notably for his design of the Hiroshima Peace Memorial Park (1955). His influence extended to the Metabolism movement of the 1960s, which was further advanced by architects such as Kisho Kurokawa (1934-2007) and Kiyonori Kikutake (1928-2011) (Figure 7).[16]

Although modernism exerted a strong influence throughout the second half of the twentieth century, a synthesis of modernist principles and traditional Japanese spatial design emerged

[14]John Zukowsky et al., eds. *Japan 2000: Architecture and Design for the Japanese Public*. Munich; New York: Prestel Verlag, 1998.

[15]Kishida, see n. 1.

[16]Zukowsky et al., see n. 14.

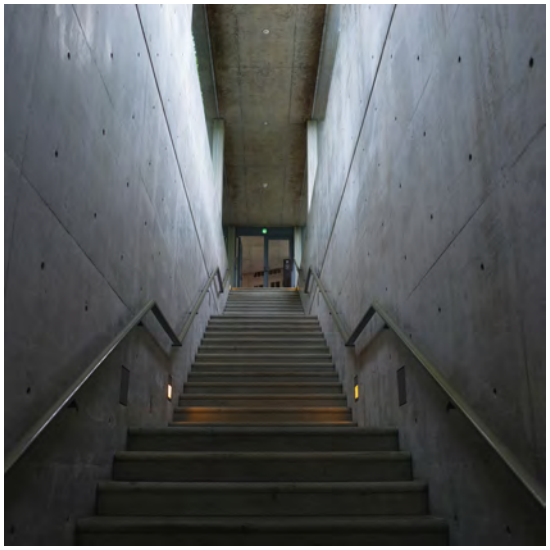

Figure 8: The new wing of the Oyamazaki Villa Museum of Art in Kyoto, designed by Tadao Andō in 1996.

in its final decades. This development is exemplified by the work of Tadao Andō (born 1941), whose use of smooth concrete, wood, and a focus on light reflects the influence of Zen aesthetics (Figure 8). Similarly, Kengo Kuma (born 1954) became a prominent architect by integrating natural materials and employing organic forms to achieve what he described as a "new form of wabi-sabi"[17] (Figure 9).

In the 1980s and 1990s, postmodern architecture also emerged in Japan, exemplified by the works of Arata Isozaki (1931-2022) and Toyō Itō (born 1941), which incorporated playfulness and eccentricity. By the 1990s, a shift toward minimalism became apparent, pioneered by Andō and further developed by Kuma and Itō.[18]

From the 2000s onward, architectural firms such as SANAA, led by Kazuyo Sejima and Ryue Nishizawa, advanced minimalism by, like Andō, emphasizing lightness, transparency, and nuanced spatial relationships, characterized by a continued blending of concrete, wood and other natural materials, and subtle references to traditional aesthetics. Although global influences remain, there is a pronounced emphasis on local traditions that reflect Japan's historical context. The integration of architecture within the community remains a central concern, characterized by the Japanese concept of *Machizukuri*, where neighbourhood development is a community effort.[19]

Cities such as Kyoto, which preserve neighbourhoods of cultural heritage, demonstrate

[17]Dana Buntrock. *Materials and Meaning in Contemporary Japanese Architecture: Tradition and Today*. Oxon, UK: Routledge, 2010.

[18]Zukowsky et al., see n. 14.

[19]Haimes, "*Machizukuri* (Neighborhood Making): Collective World-Making in Traditional Japanese Neighborhoods," see n. 7.

Figure 9: SunnyHills cake shop in Minami-Aoyama, Tokyo, designed by Kengo Kuma in 2013. The building's shape is inspired by a pineapple.

how contemporary architecture can be informed by the past: new designs need not replicate historical forms, but should maintain a sense of continuity with them.[20] On the other hand, Tokyo, in many parts, is a symbol of Japan's postwar boom – a modern city, but one that appears like it may have peaked in the last decades of the twentieth century. Despite a history of devastation from both the Second World War and natural disasters, a handful of neighbourhoods maintain Meiji, Taishō, and early Shōwa-era buildings and streets, such as Kagurazaka, Yanaka, and parts of Ueno. Areas such as these have become known for their retro aesthetic, complete with nostalgic streetlights, signage, and even through the decor of their traditional kissaten cafes and restaurants.[21]

5 Environmental sounds

Sound constitutes a significant yet often overlooked aspect of environmental experience. For centuries, Japanese architecture and its landscapes have been closely associated with the sounds that accompany them. Temples frequently feature large bells (*kane*) that resonate across the landscape, a phenomenon still common in cities such as Kyoto and Kamakura. Historically,

[20] Haimes, "*Machizukuri* (Neighborhood Making): Collective World-Making in Traditional Japanese Neighborhoods," see n. 7.

[21] All About Japan. *5 Retro Hangouts in Greater Tokyo*. All About Japan. Accessed May 12, 2026. 2018. URL: `https://allabout-japan.com/en/article/7087/`.

Figure 10: *Suikinkutsu* at Taizōin within the Zen monastery Myōshinji, Kyoto. These devices feature a cavernous pot submerged below the ground.

these bells have marked the passage of time, signalled the start of meditation, or indicated important religious events. For example, the *Joya no kane* (new year's bell) event on New Year's Eve involves ringing the bell 108 times to symbolize, in Buddhist tradition, the cleansing of the 108 earthly desires.

The interplay between sound and space appears in various distinctive forms. One noteworthy example is the *suikinkutsu*, a water-based acoustic installation sometimes found in temple gardens, from the Edō period to the present day. It consists of a ceramic pot with a small hole at the top buried underground, usually placed alongside a stone water basin, referred to as a *tsukubai*. Water slowly drips into the pot, where the sound echoes softly. A bamboo tube is sometimes placed near the opening, inviting visitors to listen, introducing an interactive auditory dimension to the garden.[22]

In recent decades, Japan's attention to sound has influenced the development of Japanese ambient music, often referred to as kankyō ongaku (environmental music). While ambient music is internationally associated with Brian Eno (born 1948), Japanese artists in the 1980s expanded the genre in unique ways. Inspired in part by Erik Satie's (1866-1925) concept of 'furniture music,' composers such as Hiroshi Yoshimura (1940-2003), Satoshi Ashikawa (1953-1983), and Midori Takada (born 1951) created works intended to integrate seamlessly into architectural spaces, including department stores, museums, and outdoor installations. These compositions were designed to blend with their surroundings rather than command attention, reflecting the Japanese emphasis on subtle, integrated sensory experiences.[23]

[22]Paul Haimes. "From Edo-Period Gardens to Kankyō Ongaku (Environmental Music): Appreciation of Environmental Sound in Japan." In: *Contemporary Aesthetics* 24 (2026).

[23]Haimes, "From Edo-Period Gardens to Kankyō Ongaku (Environmental Music): Appreciation of Environmental Sound in Japan," see n. 22.

Many of these works incorporated environmental recordings, as in Yoshimura's 1986 album *Green*, which blends soft electronic sounds with field recordings of natural elements. Other compositions were commissioned for exhibitions or designed to accompany visual installations. In all cases, sound is an integral component of the spatial experience rather than an isolated phenomenon, but one that sits in the background, rather than being overbearing.[24]

The integration of sound into everyday environments in Japan is also evident in practical applications. Urban spaces employ auditory cues such as spoken instructions on escalators and train platforms, vending machines that announce purchases, and devices that emit gentle chimes. These sounds facilitate navigation, establish predictable urban rhythms, and enhance accessibility for individuals with visual impairments, although the persistence of amplified noise in urban environments raises important questions about both political expression and individual rights to privacy.[25]

6 Summary

Japanese architecture has developed through a sustained emphasis on flexibility through frequent use of modular design and, in many cases, integration with the natural environment, with Japan's susceptibility to natural disasters having a significant impact on approaches to the built environment. Everything from early temples and shrines to tea rooms, gardens, and *machiya*, demonstrates how these forces have underpinned the design of spaces intended for religious practice, domestic life, and social and commercial interactions. While Western materials and architectural styles transformed the built environment from the Meiji period onward, many contemporary architects, such as Tadao Ando and Kengo Kuma, continue to reinterpret traditional principles in modern forms. Furthermore, the incorporation of auditory elements in gardens, and the more recent utilization of ambient music and other environmental sounds, demonstrate that Japanese architecture is a multisensory practice in which sound also significantly contributes to the spatial experience.

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[25]Daniel Dolan. "Cultural Noise: Amplified Sound, Freedom of Expression and Privacy Rights in Japan." In: *International Journal of Communication* 2 (2008), pp. 662–690; Kenji Kurakata and Ken Sagawa. "Development and Standardization of Accessible Design Technologies that Address the Needs of Senior Citizens." In: *Synthesiology – English Edition* 1.1 (2008), pp. 15–23.

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