

Difference and Repetition

Reactivating Tokyo architectural elements in Nezu

Milica Muminovic

University of Canberra

Abstract

Nagaya houses were an important part of urban life in eighteen and nineteenth century Tokyo, where they housed artisans and were at the centre of the city's urban culture. While the practice of constructing nagaya houses has long been lost, and traditional architectural elements are rarely quoted physically in Tokyo's contemporary architecture, a sense of traditional nagaya architecture is still recognisable in the city's Nezu district. Given this, how are the contemporary versions of nagaya houses generating quotations of traditional architecture within the context of a dynamic and rapidly changing urban landscape? This paper interrogates how contemporary low city Tokyo houses repeat and differentiate traditional models (nagaya) by comparing contemporary dwellings with historical data. It uses observation, drawing, photograph taking and mapping of the contemporary Tokyo houses in Nezu and comparative analysis with Edo, Meiji, Taisho and Showa period nagaya houses to discuss the level and character of change. The analysis focuses on urban and architectural scales and concludes that maintaining the relationship between the public space of the street and the private space of the house is generating possibility for dynamic quotation. Although nagaya houses have been changing significantly over time, the relationships between urban and architectural elements have remained.

Introduction

Tokyo is fast changing city. The average lifespan of the single family house is only 26 years.¹ This culture of change influences the traditional architecture. The use of timber seems to further contribute to the architecture's short lifespan. In addition to cultural and climatic characteristics affecting traditional architecture, there are also historical conditions that influenced specific relationship towards preservation. It can be argued that Tokyo has a long tradition of rebuilding itself. When it was known as Edo (1601-1868), the city was redeveloped after each of the many city-wide fires. Major conflagrations occurred on average every six years and many minor ones every year.² The architecture, particularly in the dense lowland areas of the city, was in some cases designed for a short lifespan. An interesting type that emerged in this period was burnable house (*yakeya*), designed to be burned, using light, temporary and low-cost materials, as those houses had been continuously rebuilt.³ The last two important events that significantly affected the city's structure and architecture were the Great Kanto earthquake (1923) and Second World War bombings (1945). Most of the city burned because of the earthquake⁴ and the WW2 destruction was even greater.⁵

Contemporary Tokyo continues this tradition of rebuilding. As a result of constant redevelopment, Tokyo has no iconic buildings and a different sense of history compared to other cities.⁶ It is argued that memory and quotations of the traditional architecture are not physically present in Tokyo and that the past is mainly present in the commodified form (museums and consumer products).⁷ The Edo-Tokyo continuity can be sensed through topography, roads, land use, scale of the buildings and plots, and the relations between the nature and the city, especially rivers.⁸ There has been a growing interest in the Edo period literature and architectural and urban research since the 1980s.⁹ The rediscovery of 'Japaneseness' and places that still contain historical characteristics continues to multiply in design discourse.¹⁰ Despite Tokyo's rapid changes, references to traditional architecture are still an important part of city's identity.

The complexity of referencing traditional architecture can also be found in the distinctiveness of culture and religion. Grounded on the Shinto and Buddhist traditions, Japanese architecture has unique approach to rebuilding and quoting traditional architecture.¹¹ These traditions have an implication on the architecture in which building is not a material object but the space generated inside that object.¹² In that sense, its facade or walls become infinitesimally relevant.¹³ Some also argue that the Japanese places are defined by their activities rather than built spaces.¹⁴ The Ise shrine is example of that particular quoting process. The temple is rebuilt every twenty years and demonstrates the tension between impermanence of the materials and ambition towards enduring qualities of iconic architecture.¹⁵ It is a secular storehouse with a traditional raised floor that has become a form of sacred architecture that needs to be kept in its "pure" state. There are architectural, religious and political reasons for rebuilding the Ise shrine and its unique relationship with preservation of tradition. First, the architectural motives are related to the deterioration of construction materials. For example, timber pile construction accelerates the process of decline. Secondly, the concept of rebuilding fits well to the cyclical understanding of everything in nature as addressed in the Shinto religion. In addition, "the pure, clean image of the buildings in Shinto architecture is essential to the preservation of the sanctity of the site for the gods".¹⁶ Rebuilding the shrine every twenty years has generated that specific relationship towards tradition, where the "pure" appearance of the form is more important than the building's materiality. The building's form and construction has been changing over centuries, thus producing an interesting way to reference the original building. Preservation becomes more of the religious ritual of rebuilding rather than conserving the object itself. The process of rebuilding has thirty-two major rituals and lasts for eight years. The transmission of the master carpenter's skills is more important than the building itself.

The Ise shrine example demonstrates the complex approach towards the quotation of traditional architecture. On the one hand there is the importance of formal purity to be requoted every twenty years, but on the other hand the repetitive process of quoting and rituals are becoming more

important than the quote in itself. Does this approach, the regular traditional replacement of an original architectural object affect the quotation of tradition in contemporary Japanese architecture? Is this creating more dynamic process of quotation, the one that allows for difference and further development of the traditional architecture, and what is the degree of change of the quote in which it stops to reference traditional architecture?

In order to answer these questions the paper proposes to observe the dominant nagaya type of the traditional residential architecture in Tokyo. This city is interesting place for observing the dynamic process of quoting traditional architecture, particularly in everyday residential spaces. Because of the speed of change and historical reconstructions, there are only a few Tokyo areas that can be argued to have some kind of the reference to the traditional architecture, although none of the buildings are older than one century. Most of the buildings do not even attempt to physically replicate elements of the traditional architecture. Yet, researchers and general public seem to consider that those buildings reference traditional architecture.¹⁷ One of such places is Yanesen, an area that consists of three neighbourhoods, Yanaka, Nezu and Sendagi. In Nezu there are no buildings preserved from the past and it belongs to a cultural milieu that favours change. However, Nezu is an area that is characterised to have a traditional flavour of Edo and its low city (Shitamachi). Therefore, this area is an interesting place to further explore the referencing of tradition without the formal preservation of architecture or its elements.

This paper explores the characteristics of the historical low city and its primary residential building type (nagaya) and compares it with Nezu's contemporary residential architecture.¹⁸ The comparison aims to interrogate quotations of traditional nagaya houses that contribute to the sense of traditional architecture in Nezu. The method is based on the observation, drawing, photograph taking and mapping of the nagaya houses.¹⁹ The paper uses comparative analysis of Edo, Meiji, Taisho, Showa and Heisei period nagaya houses to discuss the level and character of change. The analysis focuses on urban and architectural scales and thus, the paper firstly outlines main characteristics of Shitamachi (low city in Edo) and then focuses on the architectural characteristics of nagaya. The discussion arises in relationship to the morphological difference and repetition of traditional architecture and its application to the development of contemporary residential architecture in Tokyo. The paper focuses on quotation within architecture that references past but in the same time manages to refer to modern conditions.

The Urban Characteristics of Shitamachi

The grid of the low city (Shitamachi, commoner areas) was rigid, orthogonal, while the streets of the high city (Yamanote) followed the terrain, with two main types of the roads: one that follow the slope and other which cut through.²⁰ The samurai areas in Edo occupied two-thirds of its territory with population of quarter of that in commoner area, demonstrating the intensity of land use.²¹ The area's density is now celebrated and romanticised, within the sense of small and human scale, but it was also overcrowded.²² Standard nagaya dwelling for the artisan and poorer tradesman were in the back alleys called "nine-by-twelve", consisted of two rooms, one of them earth-floored, with nine feet of frontage on the alley, and extended twelve feet back from it. The houses were predominantly timber construction and one storey high. According to Seidensticker, they lived with mud, dust, darkness, foul odours, insects, and epidemics.²³ Nevertheless, some of the wealthier merchants of the area lived almost expensively and extravagantly as aristocrats in the high city. In late 18th century Edo, most dense areas were up to 58000 people/km². Most houses were only one storey high - only those facing the main streets could be two storeys.²⁴ Due to the overcrowding, the city was proud of its fires, which were called *Edo no hana* ("flowers of Edo"), which brought opportunity for rebuilding and for better living conditions.²⁵ Following that, the backstreets of Edo, called *uradana* were widened anytime it became possible.

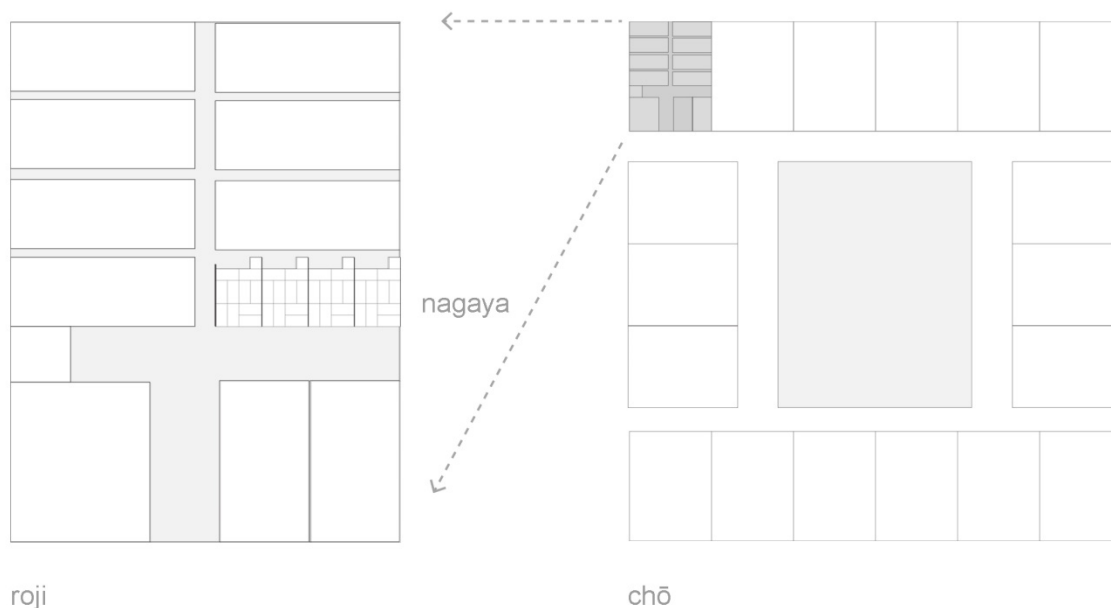


Figure 1. Urban layout of the chō and roji (drawing by author, based on Sornsen, 2002)

The characteristics of Edo's different house typologies were based on terrain and class divisions. Edo was divided into commoner areas (*machi-chi*), samurai areas (*buke-chi*) and temple areas (*jisha-chi*). Due to the fact that these areas' separations were guided by topographical characteristics, they were therefore intermixed.²⁶ Each district was defended by its own walls, and hence was contributing to general defence of the city. In Edo, temples, shrines, higher class warriors (*hatamoto and damyo*) districts had their own gates. Within the low city areas each neighbourhood was also gated and guarded by the residents.

The low city was laid out in the grid pattern following Chinese model adopted in Kyoto and was planned by city elders (Figure 1). The configuration of urban elements was based on the block (*chō*, 109m in length and width). The block has developed through various stages into the latter pattern of the neighbourhood that consisted of two gates. The *chō* had approximately 300 people, which were of diverse classes of commoners: from wealthy merchants, landlords, and shopkeepers with the houses fronting the main streets (*omote-chi*) to the tenants of *nagaya* in the back alleys (*ura-chi*) who were usually employees or servants of the merchants. Land use was also mixed, with shops facing the main streets and small-scale handcraft industry in both front-street houses and back street tenements and residences. Traditionally these blocks were subdivided in 12 plots each measuring 18m x 36m. In commoner areas in Edo the plots were slightly smaller leaving an open space at the centre of the block (*kaishōchi*), which was used for the well, garbage collection area and neighbourhood shrine. With the continuing pressure on the land and overcrowding, these *kaishōchi* were subdivided during the 18th century and built over with *nagaya*, leaving no open space in the neighbourhood.²⁷

The Characteristics of Residential Typology in Edo period

Three main types of the buildings dominated Edo period urban scene: warrior class residences (*buke-yashiki*), townhouses (*machiya*) and row houses (*nagaya*). Warrior class residences consisted of one or more buildings standing in the garden surrounded by high walls and large gates, located at the high city areas. The boundary between public space of the street and private space of the house was clearly defined with high fences and gates. The streets were used only as circulation space.²⁸ *Nagaya* and *machiya* were types of the houses located at the low city. The townhouse functioned as

residence and a shop, office, warehouse or workshop. Thus, the boundary between house and the city is in this case dissolved through introduction of public service activities. Streets become “lively” places, where many activities were conducted. Nagaya was the row house at the rear of town houses, usually housing the servants, and was the most numerous of all types.²⁹

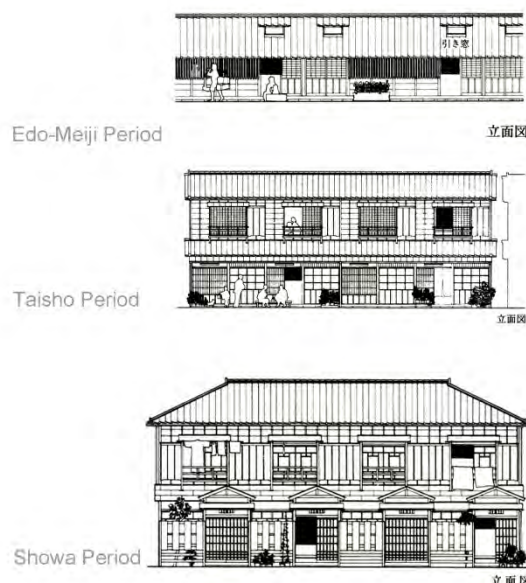


Figure 2. Nagaya type development of facade (from: Taito Ward Shitamachi Museum). Edo (1601-1868) Meiji (1868-1912) Taisho (1912-1926) Showa (1926-1989) Heisei (1989- today).

The row houses were aligned next to small alleys (*roji*) only 1m or 2m wide, behind and between *machiya*. The entrance to the house was directly from the alley, which was perceived as semi private space, shared among the tenants (Figure 1).³⁰ Usually, the alley was gated and served as space for cooking and other domestic activities.³¹ Waley explains that appearance of nagaya was not strictly planned during the Edo period and they emerged due to housing shortages.³² The most common nagaya at that period was the smallest one, having the front width of nine *shaku* (a *shaku* is 2.7m) and only two *ken* deep (3.6m). 70% of Edo's townspeople lived in this type of the house. Nagaya houses were tenant based and usually had number of dwelling units under one roof. During the Meiji period the number of this type of the building increased spreading to the city's northern and eastern developments. In this period those settlements were considered to lack in comfort and living standard. In Taisho period the first City Planning and Urban Laws (1919) were introduced, which started to address the problems in low city areas. The new law focused on the adaptation of the existing low land areas, widening the roads that allowed building to increase their height. These laws affected the dynamics of change in the low lands, gradually widening the streets and allowing larger houses to replace the small tenant nagaya structures. The same tradition continues today. In contemporary Tokyo there are almost no nagaya left. The laws have promoted widening and opening of the streets which has largely changed the structure of the narrow back alleys.³³ Under current law, alleys are considered as hazard spaces, due to the fires and the fact that they are too narrow for the fire brigade to go through. There are still some reminiscences of the *roji* areas.³⁴ Although they are not gated, the fact that they maintain the size (which is in some cases only one meter wide) preserves that sense of semi-private space. Because of the proximity of the private space of the house and the small scale of back alleys, they are creating the sense of Edo through this semi-private space.

The Dynamic Change of the Nagaya Type of House

The warrior house type has been celebrated in the architectural discourse and some of the buildings are still preserved in Tokyo. On the other hand, nagaya as the commoners' dwellings have been ignored as heritage and due to significantly change over last four centuries. Furthermore, as an

ordinary and less important dwelling, nagaya have been changing throughout the history. *Nagaya* houses in the Edo and Meiji periods exhibited fairly different characteristics of Taisho and Showa period nagaya.

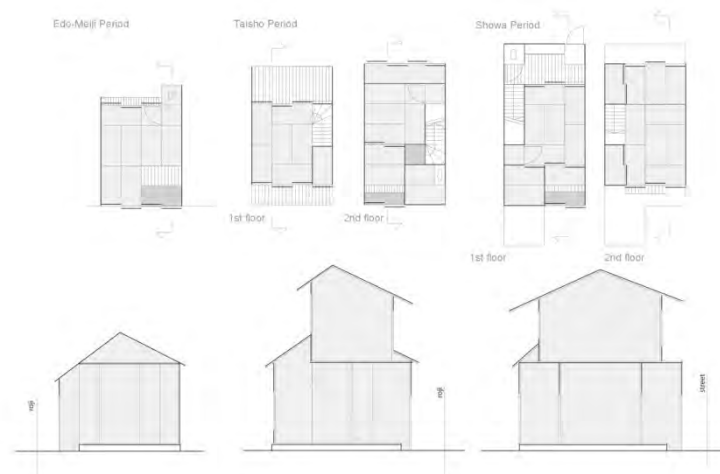


Figure 3 Development of nagaya type (top: plan, bottom: section)

Because of the constant change of the nagaya type, there are only few of Edo original houses, and they have been reconstructed in the museum together with the later alterations to the houses in Taisho and Showa periods. Thus, the material for analysis is deriving from the information gathered from Taito Ward Shitamachi Museum and fieldwork conducted in Yanesen (with specific focus at the nagaya types in the areas around Nezu area) (Figure 2, 3 and 4). The contemporary houses in Nezu demonstrate the current adaptation of the nagaya type.

During the Edo period nagaya was one storey high, consisting of earthen floor entrance and single room for one tenant (Figure 2). The house would have had four or more tenant units under one roof. During the Meiji period it was still dominantly one storey high, consisting of one room, however gaining the toilet and kitchen. During the Taisho and Showa periods the size of each apartment in nagaya gradually became bigger. Most of the houses of this type in those periods have two floors, and gain plan complexity.

During the Heisei period, the modernisation of the nagaya type continued. Major transformations occurred in the construction, including the loss of the earthen floor. Contemporary reminiscences of the nagaya type of the house suggest changed materials, size and functional organisation. The houses are built on the concrete footings which have lost the connection to the ground. In addition, the flow of air on slightly raised structure on the piles has also been lost on the bases on new materials and ways of building. However, all of the buildings still preserve and clearly mark the space where the private sphere of the house meets the public space of the street. That is a space to leave the shoes and usually it is still at least one step below the interior, keeping that sense of earthen floor. The houses also do not follow the wooden materials on the façade. Contemporary cladding materials have replaced traditional wood. In some cases there are still timber sliding doors, however, in many cases that has been lost too.

Until the Showa period, the similarities of nagaya type are related with the organization of the apartments. Tenant units are organised next to each other in long rows. Even the name 'nagaya' of the type suggest that characteristics. It consists of two kanji characters (長屋) meaning 'long' and 'roof'. Therefore, the main characteristic of this type, apartments gathered under the one long roof, remain in this period. However, in contemporary Yanesen, observed during fieldwork, we could

distinguish two types of the residential architecture that has reference to nagaya (Figure 4, Heisei period). One has modified nagaya to separate units as individual houses (Figure 4: top), and the second clearly follows the formal characteristics of tenant structure with units gathered under one long roof (Figure 4: bottom). In the second case the layout of the apartment has been changed significantly, from two floor Showa period apartments transformed to one level apartment, however still preserving the two-floor structure of the building. The individual house has preserved the layout of the nagaya house that has usually two floors, however, the apartments are considered as individual, despite the fact that in many cases they are still sharing the walls. Ownership has changed from the tenant approach, which affects the way in which the houses are treated. In many cases individual owners are renovating and changing their apartments, demonstrated by new façade colours and materials. There is no sense of nagaya as one long building with number of tenants.

The urban context of the nagaya house has changed significantly. Until Meiji period the house did not have a direct entrance from the street. The entrance was always conceptualised through the buffer zone of semi-private space of the alleyway (roji). This alleyway was usually gated, thus creating common space for the activities that could not take place in fairly small house. In Meiji period alleyways have gradually become part of the urban public space, opening nagaya to direct contact with the street (Figure 4).

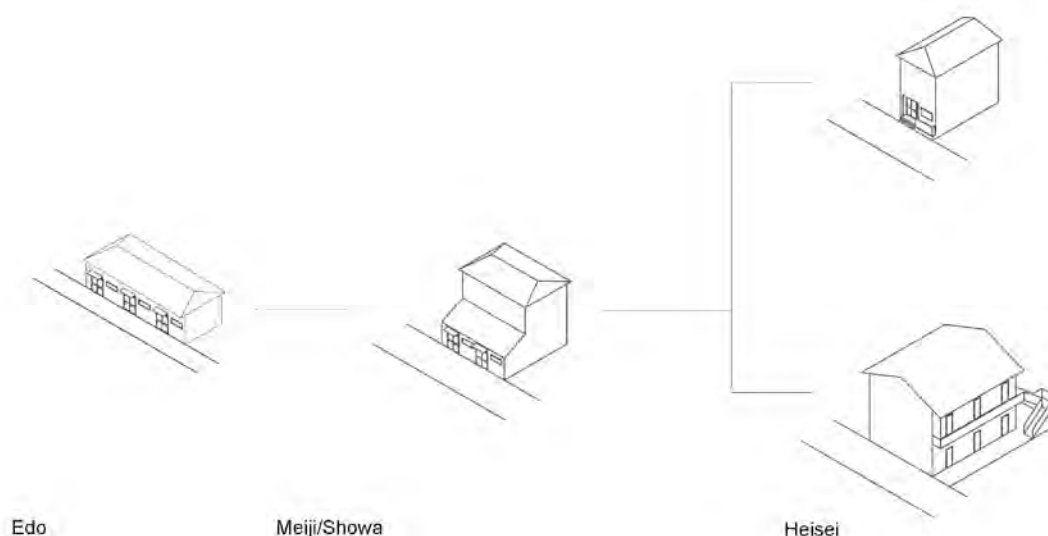


Figure 4. Development of nagaya type (based on fieldwork).

Following the same trend, in contemporary Nezu there are no preserved roji from Edo period. All the streets are public spaces accessible to everyone. However, the back narrow streets have kept the private sense of roji. In some cases those streets are just one or two meters wide. When entering from thoroughfares into the back alleys, there is a clear distinctiveness of entering into the domestic and residential semi-private streets. In the individual houses the proximity of the private space and light materials are allowing for private sounds to be clearly present in the street. Although, there is no direct sense of “eyes on the street”, somehow the fact that one can hear inside, makes the presence of the “private” more tangible. Therefore, the whole street obtains semi-private yet semi-public character, almost as if one is in the private backyard. The fragile light material of the houses transmits the sounds from the private space of home, generating that sense of roji, of private street. In addition, the houses still preserve direct entrance from the street with reference to the earth floor.

Interestingly, the houses that follow the development of nagaya as tenant structure type do not have direct entrance of the apartments to the street (Figure 4 - nagaya of the Heisei period are at the bottom right). There is always a buffer zone of semi-private space when entering each individual apartment. All the apartments are rented, similarly to the Edo period structure. The apartments are

under one roof and usually building is two storeys high. Although, from the aspect of form and layout, this type of the building is directly quoting the roji and nagaya, the type is not considered to contribute to the sense of tradition. Interestingly, the quotation of tradition is seen in the spaces that have opened traditional roji to the public, where roji has been transformed to the street and nagaya has been transformed to the individual home with direct entrance from the street.

Conclusion: Dynamic Quotation

By observing the contemporary conditions of nagaya houses in Nezu we can determine that the type has been changing significantly over time. Starting from very small narrow houses with one long roof, the type has been over the last four centuries constantly increasing in size. From one storey and single room, nagaya has been constantly expanding its size and the complexity of the layout. The contemporary houses do not have the same materials and facade expressions. There are no visual characteristics that could be linked to the traditional type of nagaya.

Without preserving the material and form, just by maintaining the relationship between two spaces, the public space of the street and private space of a house, contemporary houses in Nezu are managing to transmit a spatial sense of the Edo period. The quotations in the form and layout of the houses are not considered to have reference to the nagaya type. On the other hand, the buildings that have changed significantly, which preserve only the relationship between the houses' public and private spaces are considered to reference the past nagaya. In this sense, the quotation is in relationship and dynamic of constant transformations, rather than a simple repetition of formal architectural conditions. If the quotation emerges in the relationship between the elements, then as long as the relationship is preserved, the elements could change, generating the sense of dynamic quotation.

Along with the traditions of constant rebuilding and temporal materials as discussed with the example of the Ise shrine, we can determine the same complexity of referencing the past in residential architecture. As in the case of Ise, the process of rebuilding becomes more important than the precise quotation of the traditional forms and shapes. This complex approach to continuity and change has interesting potential for generating a new knowledge in architecture and different approach to quotation.

Endnotes

- ¹ Koh Kitayama, Yoshiharu Tsukamoto and Ryue Nishizawa, *Tokyo Metabolizing* (TOTO Publishing: Tokyo, 2010), 29.
- ² William Kelly, 'Incendiary Actions- Fires and Firefighting in the Shogun's Capital and the People's City' in J. McClain, J. Merriaman and U. Karou (eds.) *Edo and Paris- Urban Life and the State in the Early Modern Era* (Cornel University Press, London, 1994) 310.
- ³ Andre Sorensen, *The Making of Urban Japan, Cities and planning from Edo to the twenty-first century* (Routledge: London, 2002) 42.
- ⁴ Senshusha co. (eds.) *Kantōdaishinsai-shi: Shashin to chizu to kiroku de miru, 1987 - 1988-nen [Great Kanto Earthquake: View of photos and maps and records, 1987 -1988]* (Senshūsha: Tokyo, 1988).
- ⁵ Nippon map Inc, Committee to record Tokyo air raid (eds.) *Konsaisu Tōkyōto 35 ku kubunchi chizu cho: semsai shoshicu kuiki hyoji [Concise:the atlas of Tokyo 35 wards. Japan]* (Nicchi shuppan: Tokyo, 1985).
- ⁶ Paul Waley, 'Who cares about the past in Today's Tokyo?' in C. Brumann and E. Schulz (eds.) *Urban Spaces in Japan* (Routledge: London, 2012) 151.
- ⁷ Paul Waley, 'Commemoration, Conservation, and Commodification: Representing the Past in Present-Day Tokyo' *Jimbun Chiri: Japanese Journal of Human Geography*, 63 (2011), 58.
- ⁸ Hidenobu Jinnai, *Tokyo, a spatial anthropology*, (University of California Press: Berkley, 1995) 5.
- ⁹ Mikako Iwatake, 'From a Shogunal City to a Life City- Tokyo between Two Fin-de-siècles', in N. Fiévè and P. Waley, (eds.) *Japanese Capitals in Historical Perspective, Place, Power and Memory in Kyoto, Edo and Tokyo* (Routledge: London, 2003).
- ¹⁰ Evelyn Schultz, 'The renaissance of the city (toshi saisei) and the rediscovery of micro spaces (roji) in the megalopolis of Tokyo– Strategies of integrating marginalized spaces into the mainstream of urban discourse' in P Oswald (ed.) *Shrinking Cities: Complete Works 3 Japan*, (Project Office Philipp Oswald: Berlin, 2008).
- ¹¹ Murielle Haldik, 'Time Perception, or the Ineluctable Aging of Material in Architecture' in N. Fiévè and P. Waley, (eds.) *Japanese Capitals in Historical Perspective, Place, Power and Memory in Kyoto, Edo and Tokyo* (Routledge: London, 2003) and Henry D. Smith, 'Tokyo as an Idea: An Exploration of Japanese Urban Thought until 1945' *Journal of Japanese Studies*, 4 (1978) 45-80.
- ¹² Kengo Kuma, *Kyokai- A Japanese Technique for Articulating Space* (Tankosha: Tokyo, 2010) 12.
- ¹³ Yoshinobu Ashihara, *The Hidden Order- Tokyo through the Twentieth Century* (Kodansha International: Tokyo and New York, 1989) 13.
- ¹⁴ Berry Shelton, *Learning from the Japanese City-West meets East in Urban Design* (E&FN Spon: London, 1999) 10.
- ¹⁵ William H. Coaldrake, *Architecture and authority in Japan* (Routledge Japanese Studies Series: London and New York, 1996) 17.
- ¹⁶ Coaldrake, 'Architecture and authority in Japan', 38.
- ¹⁷ Paul Waley, *Tokyo: City of Storeys* (Wearherhill: London, 1991).
- ¹⁸ The results are deriving from author's fieldwork conducted in Yansen from 2010-2014. The houses were observed, photographs were taken, and the types have been developed based on that observation and in relation to traditional types.
- ¹⁹ Data was collected from the Taito Ward Shitanmahi Museum to investigate the development of the nagaya type over time, which were part of the scale exhibition of the nagaya house based on the ideal models and descriptions. The author drew all the plans and sections based on her observation and measurements.
- ²⁰ Edward Seidensticker, *Low City, High City: Tokyo from Edo to the earthquake* (C. E. Tuttle: Tokyo, 1984) 237 and Sorensen, 'The making of urban Japan', 33.
- ²¹ Seidensticker, 'Low City, High City', 9.
- ²² Toshiaki Ooka, *Edo jidai Nihon no ie: Hitobito wa dono yō na ie ni sunde ita ka [Edo period Japanese house: how people lived in the house]* (Sagamishobō: Tokyo, 2011).
- ²³ Seidensticker, 'Low City, High City', 14.
- ²⁴ Sorensen, 'The making of urban Japan', 27.
- ²⁵ Seidensticker, 'Low City, High City', 14.
- ²⁶ Sorensen, 'The making of urban Japan', 25.
- ²⁷ Sorensen, 'The making of urban Japan', 25-30.
- ²⁸ Sorensen, 'The making of urban Japan'.
- ²⁹ Shelton, 'Learning from the Japanese City', 66-68.

³⁰ S. Okamoto, *Edo Tōkyō no roji: Karada kankaku de saguru ba no miryoku [Alley of the Edo-Tokyo: attractive place to explore in the physical sense]* (Gakugei: Kyoto, 2006).

³¹ Shelton, 'Learning from the Japanese City', 66-68.

³² Paul Waley, *Fragments of a City: A Tokyo Anthology* (The Japan Times: Tokyo, 1992).

³³ S. Kojima, et al. 'Summaries of technical papers of Annual Meeting Architectural Institute of Japan', *F, Urban planning, building economics and housing problems, history and theory of architecture*, (1990), 15-16.

³⁴ A. Mori, 'Dentō-teki gaiku ni okeru gaiku no kenkyū: Yanaka Nezu Sendagi chiku no roji no kōsei patan ni tsuite (dai 35-kai kenkyū happyō taikai) [A Study of Street in the Traditional District-Pattern of Alleys in Yanaka, Nezu and Sendagi (THE 35TH ANNUAL CONFERENCE OF THE JSD)]', *Bulletin of Japanese Society for Science of Design*, 68, (1988), 74.