Office Specifications Changing with Time

Examining the office pyramid in depth

February 13, 2019

In this report, Xymax Real Estate Institute ("Xymax REI") describes the changes in the specifications of buildings that constitute the office stock explained in **Tokyo 23 Wards Office Pyramid 2019**,[*1] released on January 23, 2019, by size of building and year of completion. It also examines the situation of quakeproof measures (e.g. repairs) in old seismic standard buildings (buildings completed in or before 1981).

Please note that the office pyramid survey is based on the data of 9,206 buildings in the Tokyo 23 Wards but that the results may differ from current figures if there have been changes in building specifications (e.g. an increase in electrical power capacity due to renovation) since the time the data were collected.

*1 *TOKYO 23 WARDS | Office Stock Pyramid 2019*, released on January 23, 2019
https://www.xymax.co.jp/english/news_research/?type=research

1. Data and Completion Year of Buildings Used in This Report

[Building specification data]

As in **Tokyo 23 Wards Office Pyramid 2019 (Number of Buildings)**, the following buildings were the subject of this report (1 tsubo = approx. 3.3 sqm):

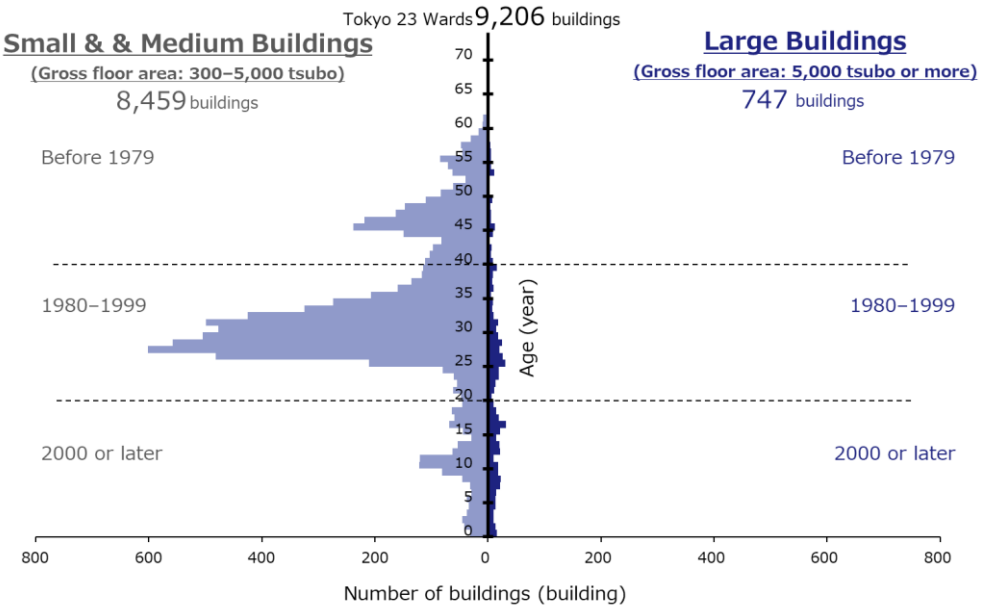
- 9,206 buildings in Tokyo 23 Wards with a gross floor area of 300 tsubo or more used mainly for offices
- Buildings completed between 1946 and 2019
- Small & medium-sized buildings refer to buildings with a gross floor area of 300–5,000 tsubo, and large buildings refer to those with a gross floor area of 5,000 tsubo or more

Data of the specifications of the buildings above (as of when the data were collected) that could be confirmed in for-rent documents were used in this report.

[Year of completion]

The buildings were classified into years of "before 1979," "1980–1999" and "2000 or later" **(Figure 1)**.

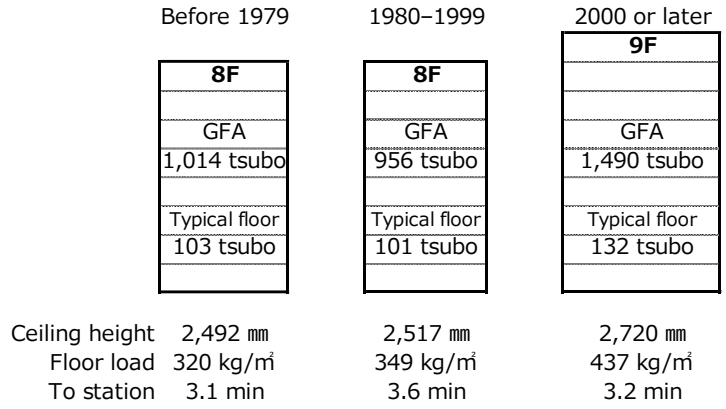
Figure 1: Office Pyramid 2019 (Number of Buildings)



2. Average Value of Specifications (by Size & Completion Year)

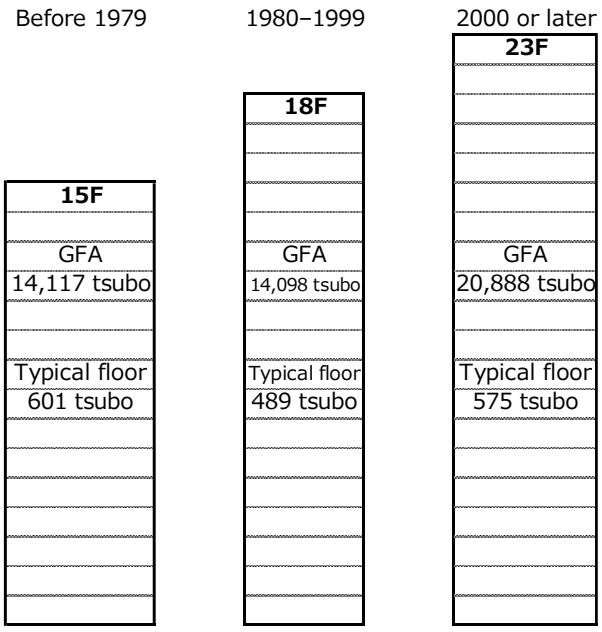
The following are the average values of each specification by size of building and year of completion **(Figures 2 and 3)**.

Figure 2: Small & Medium-sized Buildings: Average Values of Specifications



	Before 1979	1980–1999	2000 or later
Ceiling height	2,492 ㎜	2,517 ㎜	2,720 ㎜
Floor load	320 kg/㎡	349 kg/㎡	437 kg/㎡
To station	3.1 min	3.6 min	3.2 min

Figure 3: Large Buildings: Average Values of Specifications



	Before 1979	1980–1999	2000 or later
Ceiling height	2,590 ㎜	2,617 ㎜	2,812 ㎜
Floor load	318 kg/㎡	384 kg/㎡	486 kg/㎡
To station	2.6 min	3.9 min	2.7 min

For both small & medium-sized and large buildings, the newer the building was, the higher the ceiling height and the greater the floor load were. Newer large buildings were also notably taller.

Gross floor area and typical floor area are smaller and the distance from the station (in minutes on foot) longer for buildings completed in 1980–1999 than buildings completed in other years. This is probably because many small buildings and buildings located in remote places were built during the bubble economy era.

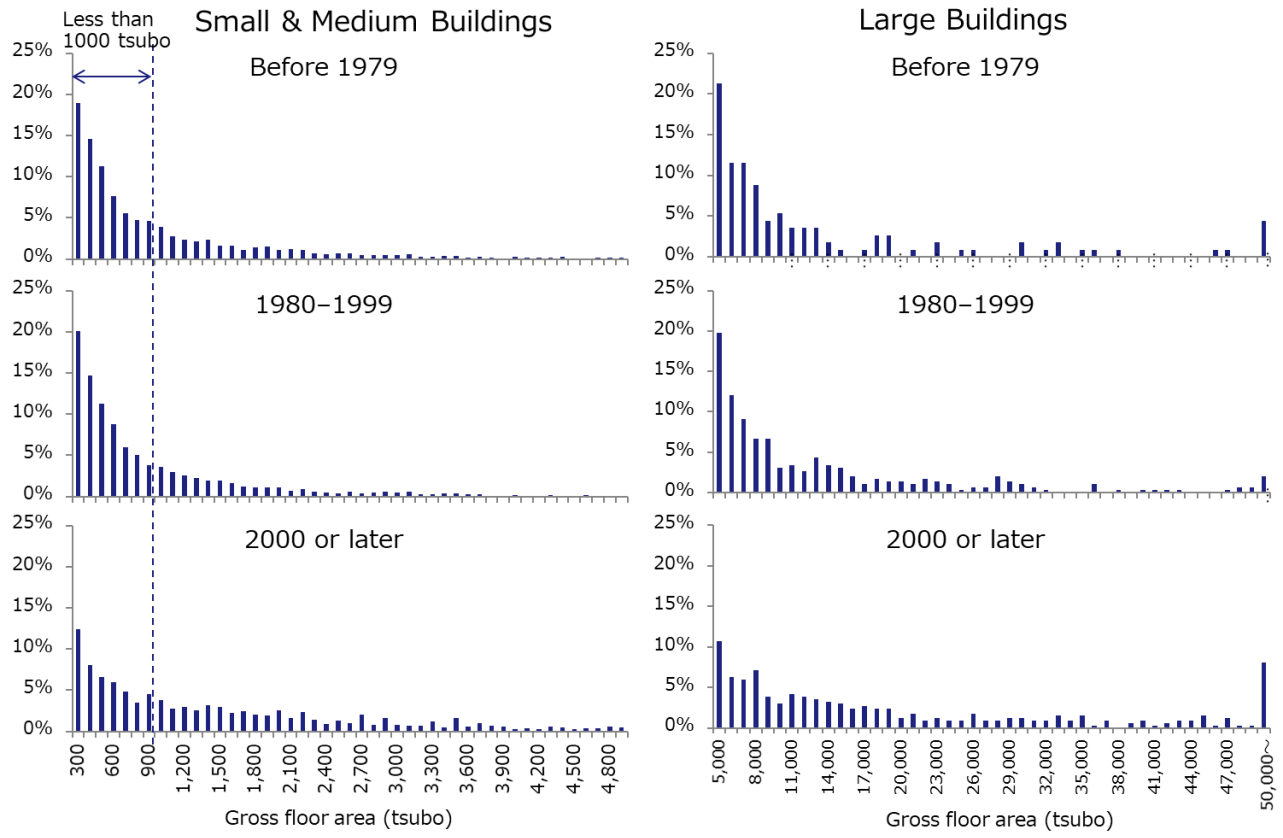
3. Changes in Specifications

The following are the changes in buildings' basic specifications by size of building and year of completion.

(1) Gross floor area

As for the floor area of small & medium-sized buildings with a gross floor area of 300–5,000 tsubo, less than 1,000 tsubo accounts for more than 60% of buildings built before 1979 and in 1980–1999, while it accounts for less than 50% of buildings completed in 2000 or later, indicating a decrease in the construction of small buildings. Among large buildings with a gross floor area of 5,000 tsubo or more, less than 10,000 tsubo accounts for more than 50% of buildings built before 1999, but its percentage decreases to around 30% for buildings built in 2000 or later. Buildings have become larger, with a gross floor area of more than 50,000 tsubo accounting for around 10% of large buildings **(Figure 4)**.

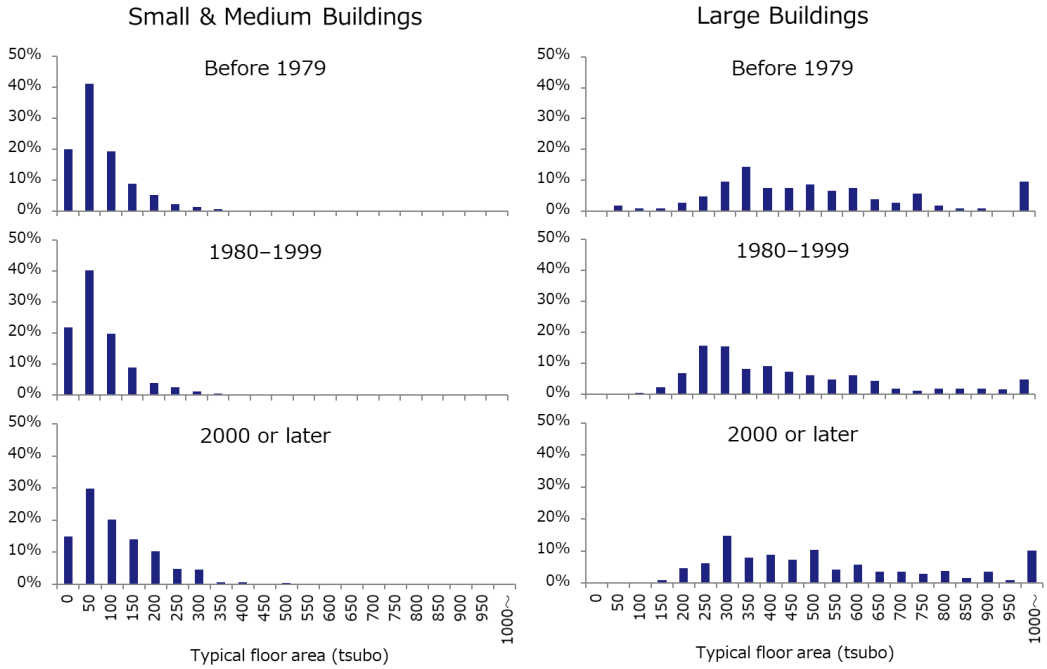
Figure 4: Gross Floor Area by Size of Building and Year of Completion (n=9,206)



(2) Typical floor area

As for the typical floor area, less than 100 tsubo accounts for a majority of small & medium-sized buildings completed before 1999, but it only accounts for less than a half of buildings completed in 2000 or later. Among large buildings, while more than 500 tsubo accounts for roughly half of the buildings completed before 1979 and in 2000 or later, it accounts for less than half of buildings completed in 1980–1999, during which the percentage of less than 300 tsubo is larger than other floor areas **(Figure 5)**.

Figure 5: Typical Floor Area by Size of Building and Year of Completion (n=7,826)

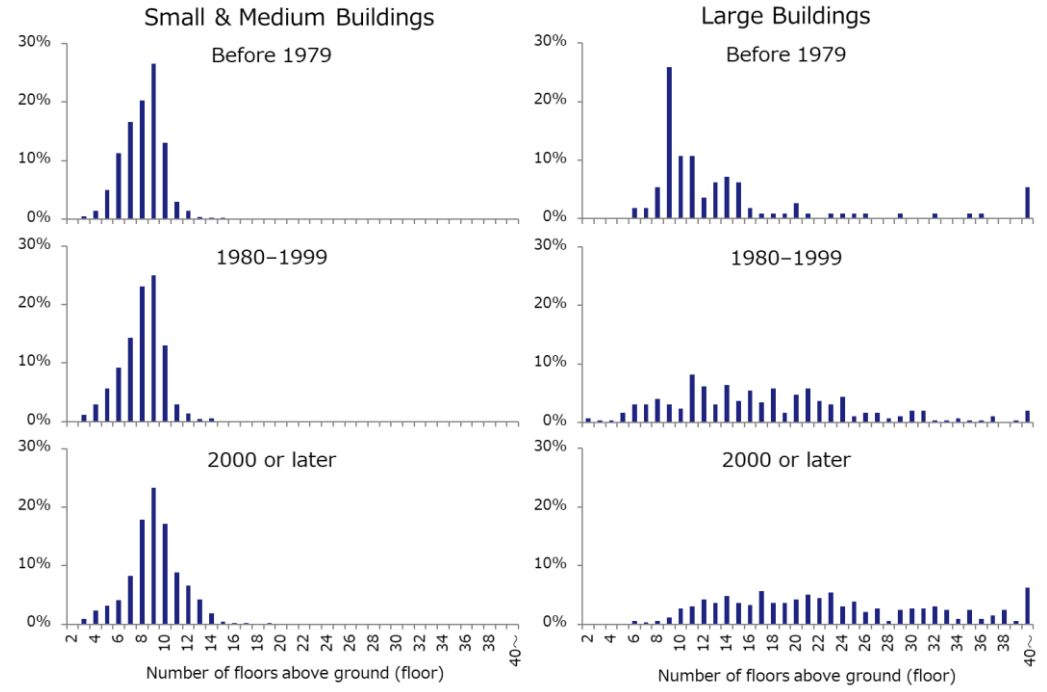


(3) Number of floors above ground

Nine floors are the most common among both small & medium-sized and large buildings built before 1979. This was probably due to the 31 m height restriction (the so-called "100 shaku (1 shaku=0.3 m) restriction").

Taking advantage of the easing of regulations, high-rise buildings started being built by the 1960s, after which the lifting of absolute height restrictions in 1970 due to the revision of the Building Standards Act and the full introduction of floor-area ratio restrictions prompted the supply of high-rise buildings. Among large buildings, 10 floors or more account for more than 60% of buildings completed before 1979, 80% of those built in 1980–1999 and more than 90% of those completed in 2000 or later **(Figure 6)**.

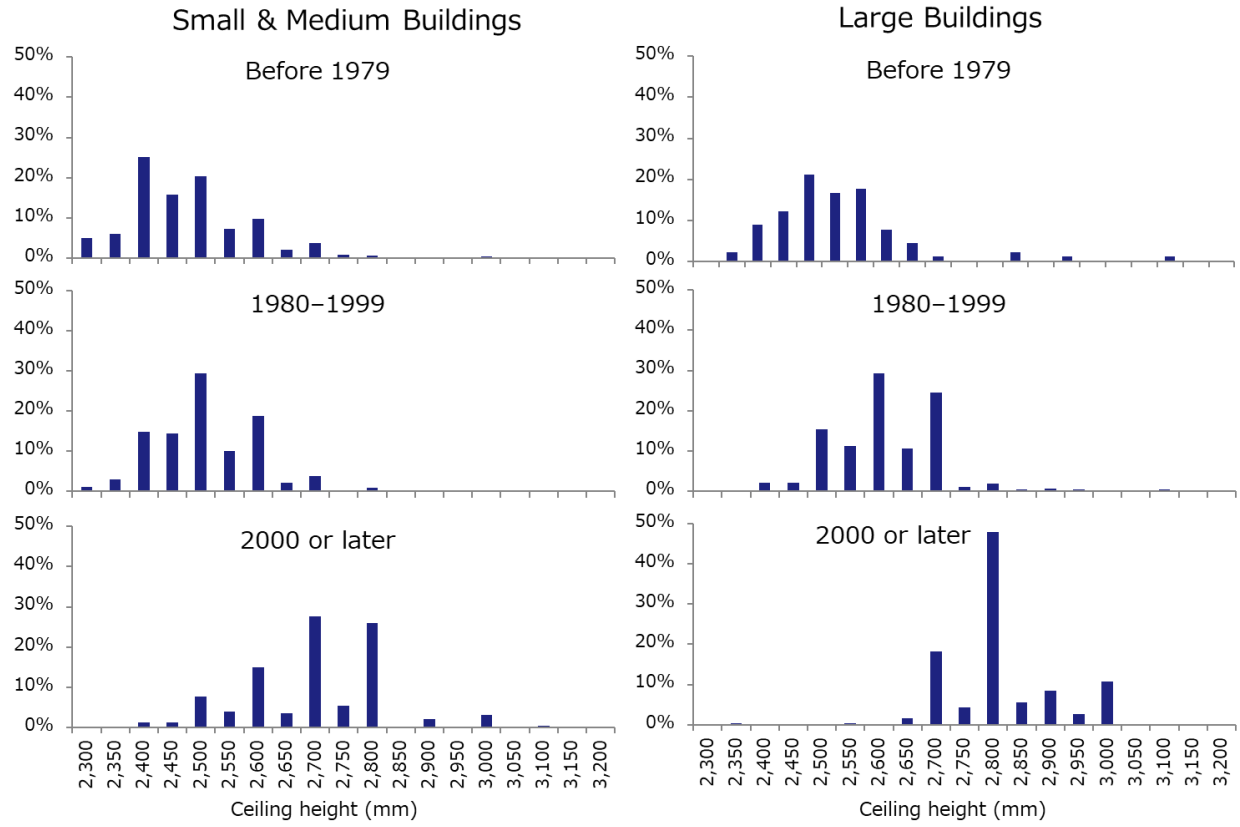
Figure 6: Number of Floors Above Ground by Size of Building and Year of Completion (n=9,206)



(4) Ceiling height

Regardless of building size, the newer the building was, the higher ceiling height it had **(Figure 7)**. Among large buildings, in particular, most of those built in 2000 or later had a ceiling height of 2,800 mm or higher. A higher ceiling height gives spaciousness and a sense of comfort to the room, leading to greater tenant satisfaction. The prevalence of OA floors and the development of a construction technology enabling pillar-free rooms are believed to be factors behind the high ceiling heights in large buildings with large typical floor areas.

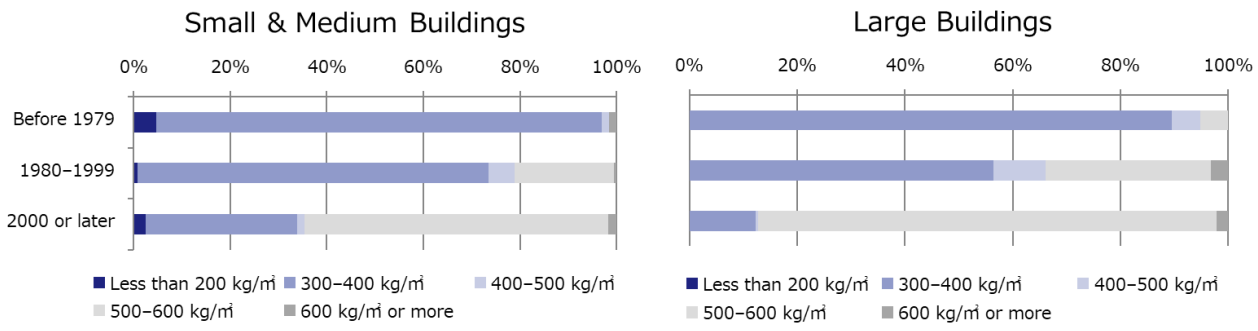
Figure 7: Ceiling Height by Size of Building and Year of Completion (n=6,289)



(5) Floor load

Floor load, which is the bearable weight of a floor per square meter, is concentrated in either 300–400 kg/m^2 or 500–600 kg/m^2 **(Figure 8)**. 300 kg/m^2 is the standard load under the Building Standards Act, while 500 kg/m^2 is probably the assumed level required when tenants install a library or a server room in the office space. A floor load of 500–600 kg/m^2 accounts for a majority of buildings completed in 2000 or later.

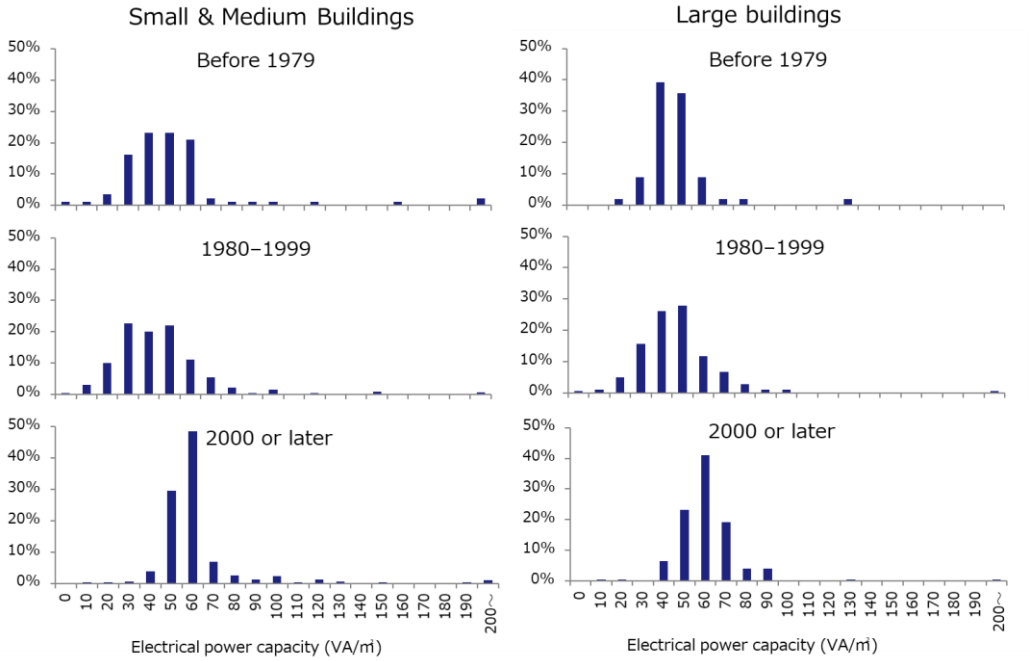
Figure 8: Floor Load by Size of Building and Year of Completion (n=1,863)



(6) Electrical power capacity

Electrical power capacity has increased with time and with the use of OA equipment by tenants **(Figure 9)**. While the standard range had been 30–50 VA/m^2 until 1999, 60 VA/m^2 has become the most common in 2000 or later, regardless of the size of building.

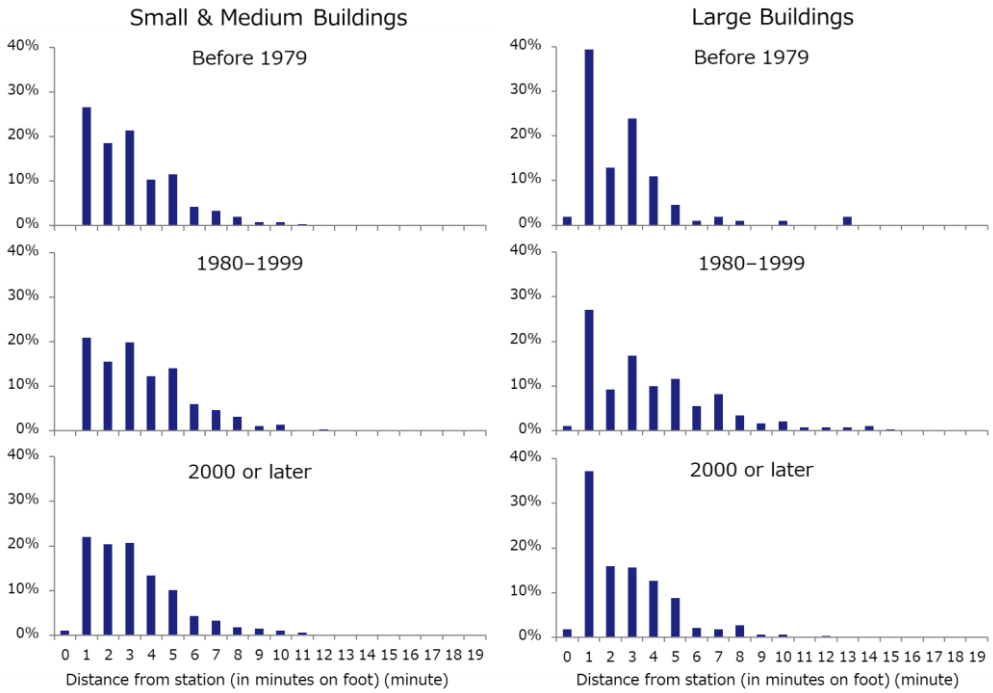
Figure 9: Electrical Power Capacity by Size of Building and Year of Completion (n=1,491)



(7) Distance from the station (in minutes on foot)

A majority of the buildings, regardless of size or the year of completion, are located within five minutes on foot from the nearest station. Large buildings are mostly located within two minutes **(Figure 10)**.

Figure 10: Distance from Station (in Minutes on Foot) by Size of Building and Year of Completion (n=8,903)



4. Quakeproof Measures in Old Seismic Standard Buildings

In **Tokyo 23 Wards Office Pyramid 2019 (Number of Buildings)**, buildings completed in 1981 or before, which are times of old seismic standards, accounted for 26% of all buildings, or 2,358 buildings (2,220 small & medium-sized buildings, 138 large buildings) **(Figure 11)**.

Figure 11: Tokyo 23 Wards Office Pyramid 2019 (Number of Buildings)

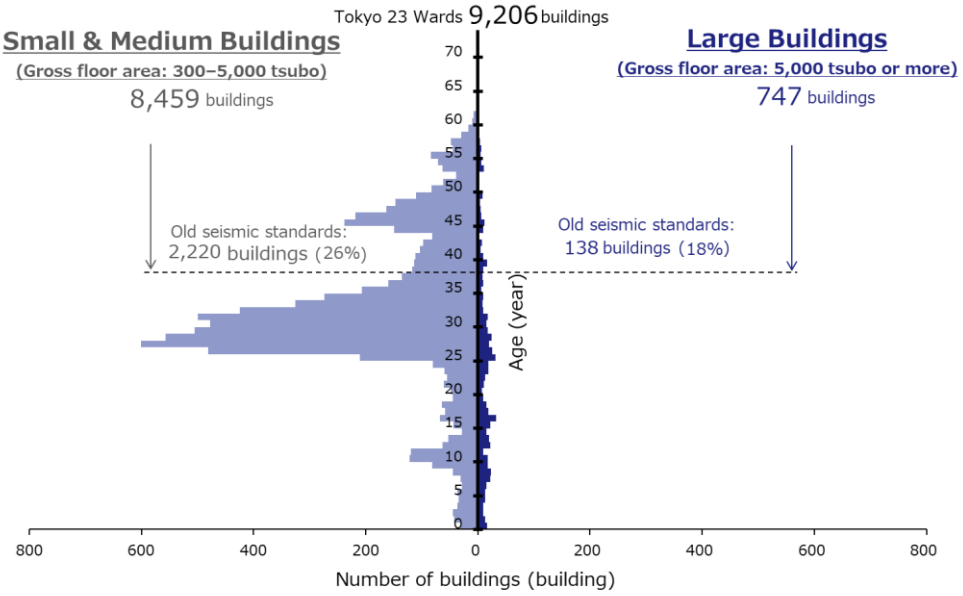
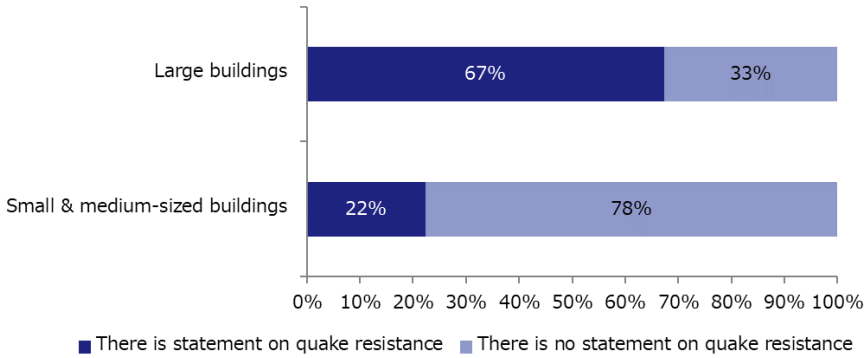


Figure 12 indicates the earthquake resistance of those groups of buildings by size.[*2]

The percentage of buildings that stated they were quake resistant in for-rent documents was 67% among large buildings and 22% among small & medium-sized buildings. Of such buildings, the percentage of those that indicated they had made quakeproof repairs was 13% among large buildings and 3% among small & medium-sized buildings, indicating that large buildings had carried out quakeproof repairs more than small & medium-sized buildings.[*3] The fact that high-rises were required to secure enough tolerance in quake resistance even before the application of new seismic standards was probably the reason why large buildings have a larger percentage of being quakeproof.

Figure 12: Statement of Quake Resistance (n=2,358)



*2 Since 2006, buildings that received building certification on or before May 31, 1981 have been required to state whether a quakeproof diagnosis have been made under new seismic standards and if so, the results of the diagnosis in the disclosure statement provided before the signing of a lease contract.

*3 Buildings that had carried out quakeproof repairs but did not state the fact in for-rent documents and buildings that carried out quakeproof repairs after the data collection date are not reflected in this percentage.

5. Observations

In this report we examined the changes in building specifications by size of building and year of completion, based on **Tokyo 23 Wards Office Pyramid 2019 (Number of Buildings)** released by Xymax REI.

The specifications of office buildings have continuously been upgraded as buildings became newer, regardless of the size of building. The background to the upgrades not only includes changes in legislation and the easing of restrictions but also tenants' needs for enhancements in electrical power capacity and OA floors to accommodate new OA equipment. The progress of construction technology in response to the changing needs of tenants has probably also contributed to the improvement of building specifications.

Of the buildings that were built under old seismic standards, large buildings were earthquake resistant more than small & medium-sized buildings. Furthermore, large buildings stated in for-rent documents that they had carried out quakeproof repairs more than small & medium-sized buildings did. Owners of small & medium-sized buildings are mostly lease operators that own one or two buildings,[*4] and lag behind in carrying out quakeproof repairs due to financial issues.

*4 *Building Owner Survey 2018*, released on October 25, 2018
https://www.xymax.co.jp/english/news_research/?type=research

Building operators had tried to appeal to tenants by pursuing higher-grade specifications in new buildings and upgrading the facilities of existing buildings in view of the new standard level of specifications so that they could gain competitiveness in attracting tenants.

However, the office features required by tenants have been changing recently. Intangible aspects that enable workers to work safely with peace of mind are becoming more important for the purpose of improving productivity. Additionally, PCs have become smaller and wireless, resulting in less need for OA floors. Server rooms are also less installed within the office space due to the introduction of cloud services.

The equipment capacity, which building operators had competed with each other to obtain as important features for tenants in choosing an office, may become excessive in the future.

As more companies introduce workstyles that are not bound by place or time in accordance with the changes of the times, the required specifications of offices are likely to see further changes in time to come.

Xymax REI will continue to study and analyze office stock from a wide range of perspectives.

Survey Overview

Period	December 2018 (The data of each specification are as of the collection date.)
Area	Tokyo 23 Wards
Target properties	Buildings completed or scheduled to be completed in or after 1946 with a gross floor area of 300 tsubo or more used mainly for offices (as of the end of 2019)

* The data were collected from properties whose date of construction is known based on publicly available information such as newspaper articles and for-rent information (including that of the past). Owner-occupied buildings were excluded.
* Any changes to the specifications after data collection are not reflected in this report.
* The office stock in 2019 includes buildings whose scheduled completion date is known as of December 2018.
* In this report, "old seismic standard" buildings refer to buildings completed in or before 1981 before the enforcement of the Revised Seismic Design Method.
* The figures may not sum across due to rounding.