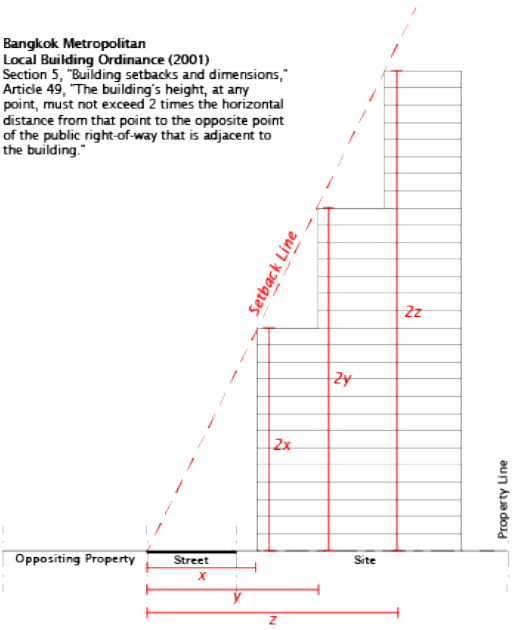
Bangkok: A Sunbaked Wedding-cake Skyline

A Proposal to amend Bangkok's Zoning shape rule for Shade over 'Light and Air.'

Bangkok's Central Business District Skyline over Sathorn Road with outlines of the city's Zoning Shape rule. Photography: Tampatra. 2020. iStock. Annotated Illustration by Author.

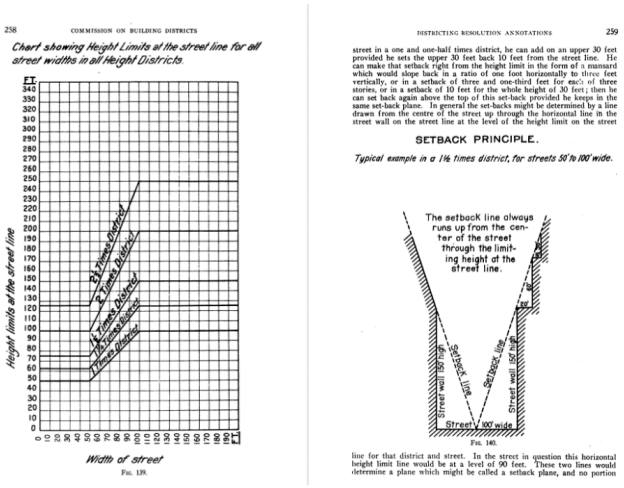
Along with other capital cities, Bangkok has been shaping its skyline to represent its modern development since its rapid urbanization in the late 20th century and is now named the 11th tallest city in Asia and 14th in the World ("Bangkok - The Skyscraper Center" n.d.). Despite various uses, heights, and façade materiality, a familiar pattern is appearing more and more noticeably: the 'Stepped-pyramid' or 'wedding-cake' shaped buildings seen in America's New York City, are concurring on the other side of the world, with many on their way to come.

The biggest culprit behind this is precisely Article 49 from the Bangkok Metropolitan's Provision for Building Ordinance of 2001, under Section 5, "Building Setbacks and Dimensions," which states: "A building's height, at any point, must not exceed 2 times the horizontal distance from that certain point perpendicular to the opposite side of the public right-of-way that is adjacent to the building." (Bangkok Metropolitan Administrator, 2001.) The rule applies to all districts in the city, by any use, and any density.

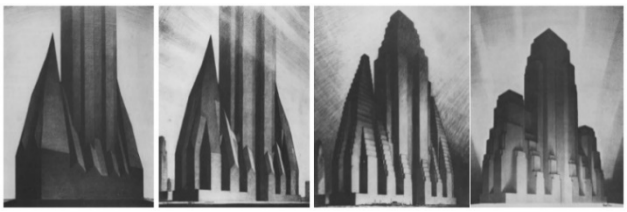


Bangkok Metropolitan Local Building Ordinance (2001) Section 5, Article 49. Illustration by Author.

The 1:2 slanted 'Sky Exposure Plane' became one of the first steps of massing studies employed by architects designing in Bangkok. While it dominantly impacted design, its true merit is rarely questioned. This paper revisits the provision and critiques how it is impractical by simply enabling a particular zoning law that originated in one place to another, without geographical considerations, and implements it homogeneously. The proposed amendment aims to encourage a more suitable climate-comforting built environment for the city.



(New York (N.Y.). Commission on Building Districts and Restrictions and New York (N.Y.). Board of Estimate and Apportionment 1916)



Ferriss, Hugh. 1922. Evolution of the Setback Building.

Bangkok enabled its first Building Ordinance in 1979 and amended to today's 2001 version. Article 49 is evidently influenced by the legacy of New York City's 1916 Zoning Ordinance where the building's shape is controlled the 'Height limits at the street line' in relation to the 'Width of the Street,' (New York (N.Y.). Board of Estimate and Apportionment 1916), resulting in "Zoning Envelopes" of buildable masses as the architect and urbanist Hugh Ferriss illustrated, in his book, "The Metropolis of Tomorrow". The invisible 'Setback Line' was claimed by George McAneny, the borough president of Manhattan who was one of the co-authors of the resolution, that it is "to arrest the seriously increasing evil of the shutting off of light and air from other buildings and from the public streets..." (Mujica 1929). Although in the following 1961 Zoning Resolution, the specific 1916 shape formula no longer applies, 'Sky Exposure Planes' still exist, with dimensions depending on the width of the street and the designated districts (The City of New York, City Planning Commission, n.d.).

Bangkok's borrowed argument to provide the right to 'light and air' for the city seems to be filled with positive intentions. However, the question is, are 'light and air' the ultimate essentials for every city? Considering such different geographies and climates of the two cities, the provision's 'envelope' is somewhat scientifically illogical because of Bangkok's steep sun path and failure to provide desirable environments of shade in reference to its tropical monsoon weather. By interpreting the original act deeper than its literal words, wasn't it more broadly achieving 'comforting conditions' for the city?

If an amount of accessible sunlight for public spaces and streets are desirable condition, the shallow angular Setback Line Bangkok implies does not coordinate with the steepness of its sun path. New York City is located at 40.71° N latitude, while Bangkok is at 13.75° N. With 27° closer to the equator, a building barely must shave itself to make way for the sun to reach the in-between horizontal spaces. On the contrary, the vertical spaces or room units, natural light is generally preferred but not necessarily direct sunlight which a slanted gesture offers higher exposure.

In addition, the argument questions the fundamental argument for a 'Sky Exposure Plane.' For a humid subtropical climate like New York City, in an average year, the temperature is between 28 °F (−2 °C) in winter and 85 °F (30 °C) in summer (Weather Spark n.d.). With a more dynamic seasonality, warm sunlight may be desirable on certain days and seasons. On the other hand, Bangkok experiences temperatures coldest at 71°F (22 °C) and hottest at 95 °F (35 °C) on an average year with a relatively stable seasonality (Weather Spark n.d.). Since a human's comfortable temperature is between 67-82 °F (19-28 °C) (ASHRAE 2015), intuitively by itself, no Bangkokians want another minute in the sun and rather prefer the shade. Therefore, with more than enough promised light by its steep sun, should the goal of such shape control be incentivizing shading rather than New York's 'light and air'?

Bank of Asia by Sumet Jumsai (1986)

Rosewood Bangkok by KPF (2018)

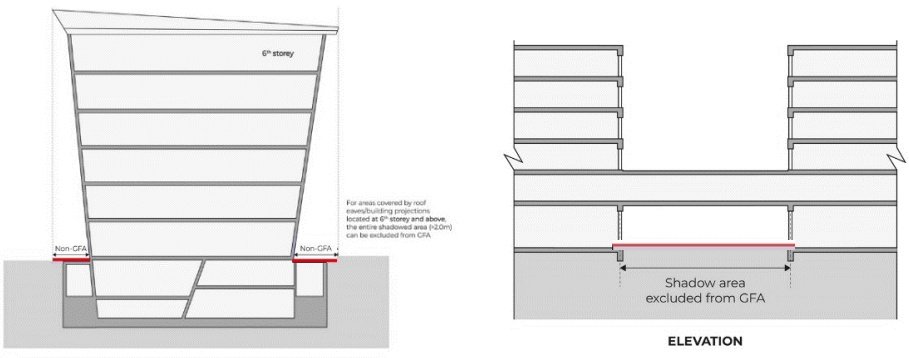
Royal Bangkok Symphony Orchestra by Herzog De Meuron (2020)

Various Buildings along Bangkok's CBD by local and international architects after enabling the Building Ordinance.

So, what is the alternative for Bangkok? To reference a relatively closer example, we look at Singapore as a Southeast Asian precedent. Singapore's Building Ordinance, issued by the Urban Development Agency (URA), has not only taken its unique climate into account but goes further by promoting self-shading architecture through building incentives with creative ground floor spaces.

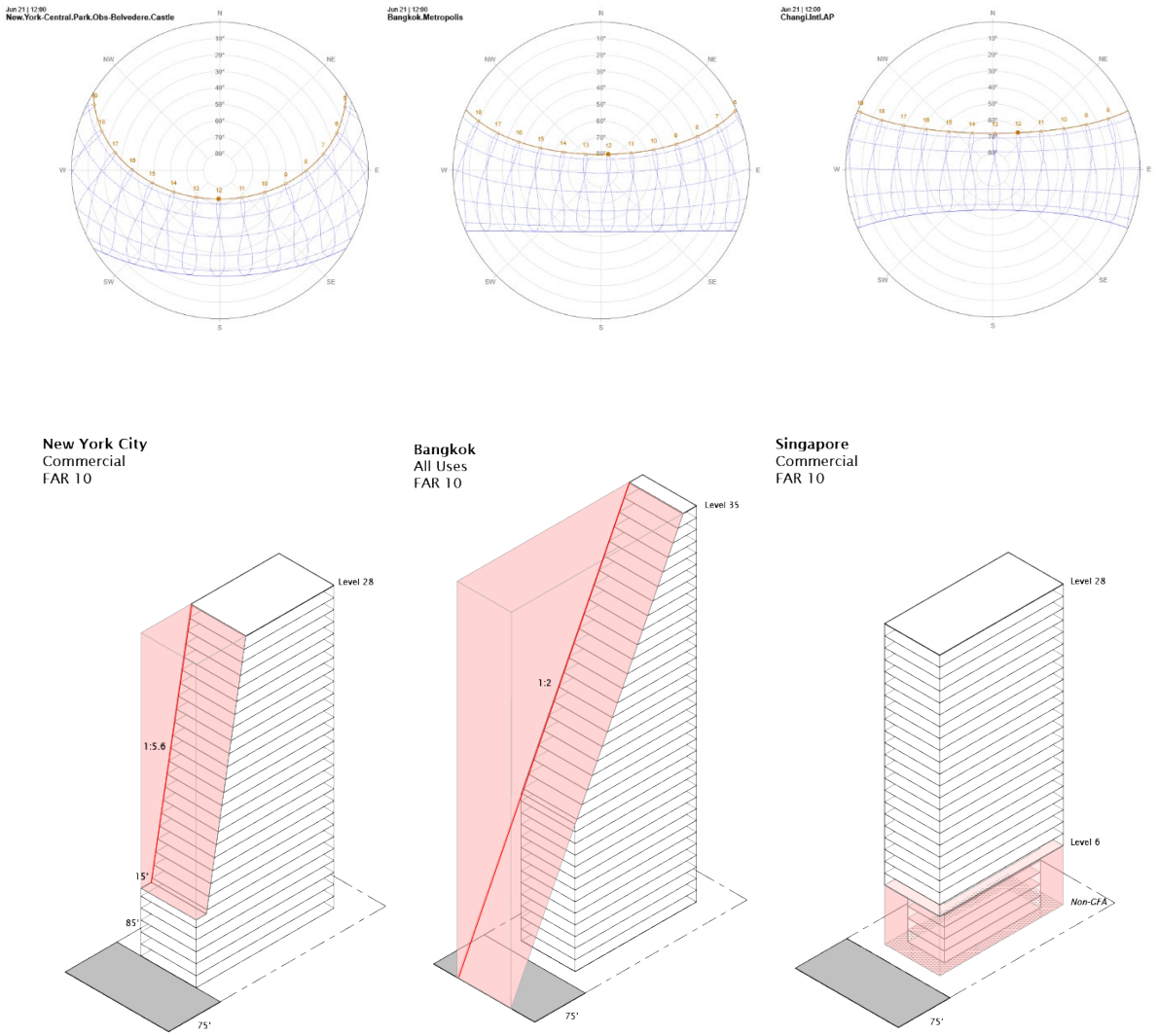
To begin with, under the URA's 'Building Setback from Boundary' sections, the only setback from a road refers to a minimum 'Road Buffer,' required due to each use and Road Category (5 hierarchical categories issued by the LTA's Road Interpretation Plan), inclusive of a 'Green Buffer (URA n.d.). Unsurprisingly, it is most reasonable that the entire Ordinance does not have anything equivalent to a 'Sky Exposure Plane' since Singapore is located only at 4° N above the equator. Accordingly, the sun is almost above one's head at all times of day all year; streets and designated open spaces are naturally assured to get an adequate amount of sunlight. Thus, the 'wedding cake' gesture is unlikely seen along Singapore's skyline.

In parallel, under "Gross Floor Area" in "Roof Eaves and Building Projections," the sections suggest a strong incentive for new building designs to offer shade by allowing to exclude certain areas on the Ground Level from the Gross Floor Area (GFA) calculation. For example, an area on the Ground that is "covered by roof eaves/building projections located at 6th storey and above, the entire shadowed area (>2.0m) can be excluded from GFA." This also applies similarly to areas shadowed by bridges or elevated linkways, regardless of height. As a result, developers would tend to align with these shading strategies to free up more buildable GFA in other parts of the building.



"Gross Floor Area, Roof Eaves and Building Projections." Urban Redevelopment Agency.

To illustrate how each city's zoning impacts the building shapes differently, the axonometric drawing shows the possible building masses resulting from required setbacks (for New York City and Bangkok) and potential strategies (for Singapore). The mass study is done under the same conditions of street width, Floor Area Ratio (FAR), and building type.



Sun charts in New York City, Bangkok, and Singapore. Produced via Climate Studio.
Possible building masses from required setbacks and potential gestures under the same conditions. Illustration by Author.

Findings from the study lead to the paper's argument that Bangkok's 'Sky Exposure Plane' provision does not play a relevant role in providing a comfortable environment to the city. To demonstrate an initial step of improvement this paper proposes the amendments on the following page.

Existing Provision (Thai):

หมวด 5

แนวอาคารและระยะต่าง ๆ

ข้อ 49 ความสูงของอาคารไม่ว่าจากจุดหนึ่งจุดใด ต้องไม่เกิน 2 เท่าของระยะราบ วัดจากจุดนั้นไปตั้งฉากกับแนวถนนด้านตรงข้ามของถนนสาธารณะที่อยู่ใกล้อาคารนั้นที่สุด

Amendment:

Section 5
Building Setbacks and Dimensions

~~**Article 49** A building's height, at any point, must not exceed 2 times the horizontal distance from that certain point perpendicular to the opposite side of the public right-of-way that is adjacent to the building.~~

Under the 2023 Bangkok Metropolitan's Provision for Building Ordinance

(1) Cancel Article 29 under Section 5, of the 2001 Bangkok Metropolitan's Provision for Building Ordinance

(2) Replace the provision by:

(i) All buildings fronting a public road shall provide a road buffer, inclusive of the green buffer, the width of which depends on the hierarchy of the road. (See Road Category)

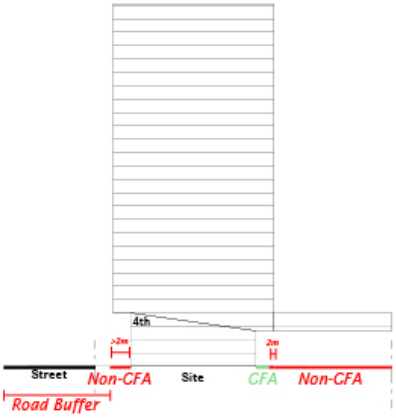
(ii) For areas covered by the roof eaves located at the 4th storey and above, the entire area is excluded from GFA but not included as an Open Space.

(iii) For areas covered by building projections located below the 4th storey, up to 2.0m width of the shadowed area is excluded from GFA but not included as an Open Space.

(iv) Areas shadowed by link bridges or elevated linkways (regardless of height) are excluded from GFA but not included as an Open Space.

Notes:

1) *The Ordinance must include a dedicated Road Categorization due to its hierarchy, use, and width. The Category will be referenced for widths of Building buffers and Green (impervious surface) buffers.*
2) *The roof eaves and sun shading devices shall be column-free and comply with the setback requirements from the common boundaries of the development.*
3) *The 4th storey height proposed is a place holding dimensions based on the author's experience as an Architect in Bangkok and the preliminary sun path information. The specified height would need to be confirmed effective through research.*

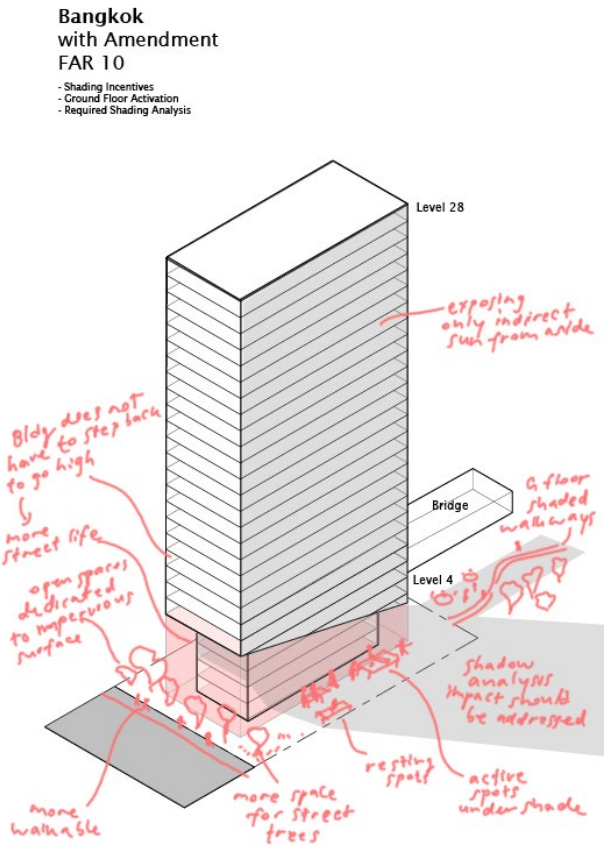


Amended provision guidelines. Illustrated by Author.

The amendment's goal is to eliminate unnecessary setbacks to open for more flexibility and incentives for shaded ground floor areas. The exterior comfortable space translates to opportunities for privately-owned public spaces, ground floor activation, and more green spaces. To step further, provision may need to be complemented by regulations requiring shaded walkways, street trees, and even shadow analysis for public spaces and nearby properties due to each location's sun orientation (Singapore Urban Design Guidebook by Urban Redevelopment Authority 2023).

In conclusion, this paper critiques that one cannot simply copy and paste a Zoning Ordinance from another city although it serves urban growth, which can be thought of as a global phenomenon, it is fundamental that all locations are different and so as climate comfort strategies should also be. Even though the subject provision was directed only to a building's shape, its externalities impact the quality of public spaces, street walkability, and simply a comfortable environment to be in.

The demonstrated amendment wishes to be a first step to critically revise the legal 'envelopes' that have frozen the city from 'shaping' itself into a more liveable city.



Possible Building Mass and spatial opportunities from the amended provision. Illustrated by Author.

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