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Singularly Slender: Sky Living in New York, Hong Kong, and Elsewhere | 纤细非凡的建筑：纽约、香港等地的云端生活



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Abstract | 摘要

This paper highlights a new 21st-century skyscraper typology – the very tall and slender residential tower – and analyzes the economic, engineering, and urbanistic forces that shape them. Once built exclusively in Manhattan and Hong Kong, “pencil towers” of 80 to 100 stories and taller are now rising in a handful of other cities, including Dubai, Melbourne, Brisbane, Toronto and Mumbai. With a base-to-height ratio of at least 1:10, but with some recent designs reaching a ratio of, so far, 1:23, the super-slender phenomenon has a wide range. The paper distinguishes two types of super-slims with significantly different development strategies: the ultra-luxury towers (defined by the exclusivity of one to two units per floor) currently found only in Manhattan; and all other tall and slender towers that plan multiple apartments per floor.

Keywords: Residential, Skyscraper, Super-slender, and Supertall

本文侧重研究一种21世纪的新式高层建筑类型超高层纤细型住宅塔楼，并分析了促使形成该种住宅类型的经济、工程及城市规划动因。高耸又纤细的“铅笔式塔楼”曾经只出现于纽约和香港，现在却不断涌现于一些城市，如迪拜、墨尔本、布里斯班、多伦多和孟买。超纤细建筑包含的范围很广，一般该类建筑的高宽比为10或更大，近年来还有的达到了23。本文将从定义并区分两种超纤细高楼的类型开始，着重研究不同的开发策略：超奢华塔楼（定义为每层仅有1-2间公寓）现仅出现在曼哈顿；及其他所有纤细的高塔楼，该类建筑的每层都设有多间公寓。

关键词：住宅、摩天大楼、超纤细、超高层建筑

This paper highlights a new 21st century skyscraper typology – the very tall and slender residential tower – and analyzes the economic, engineering, and urbanistic forces that shape them. Tall, thin “pencil towers” – once built only in New York and Hong Kong – are now rising in a handful of other cities: Dubai, Melbourne, Brisbane, Toronto, and Mumbai. With a base-to-height ratio of 1:10 or more, and with a recent design reaching a ratio of 1:23, the super-slender phenomenon has a wide range. The most dramatic examples so far are the highly publicized beanstalks of Billionaires’ Row, on West 57th Street in Manhattan, where penthouses have sold for \$90-\$100 million, and a per square foot/ square meter price has reached \$10,000-\$11,000 psf or approximately \$110,000 per square meter. Expensive to build because they require sophisticated engineering, special materials, and because they rise on difficult, constricted sites, super-slender towers only make economic sense as luxury properties. But there is luxury and LUXURY, depending on the market, and there are few real estate markets like Manhattan. Thus this paper undertakes to define and distinguish two types of super-slenders with significantly different development strategies: the ultra-luxury towers (defined by the exclusivity of 1-2 units per floor) currently found only in

本文侧重研究一种21世纪的新式高层建筑类型超高层纤细型住宅塔楼，并分析了促使形成该种住宅类型的经济、工程及城市规划动因。高耸又纤细的“铅笔式塔楼”曾经只出现于纽约和香港，现在却不断涌现于其他许多城市，如迪拜、墨尔本、布里斯班、多伦多和孟买。超纤细建筑包含的范围很广，一般该类建筑的高宽比为10或更大，近年来还有的达到了23。时至今日，最令人叫绝的案例是位于曼哈顿西57街的亿万富豪大道(Billionaires’ Row) 豆茎公寓，这座建筑得到了广泛宣传，其顶层公寓的售价为9000万至1亿美元不等，每平方英尺的售价已经飙升到了1万至1.1万美元，约合每平方米11万美元。造价之所以会如此昂贵是因为此类建筑要求采用精妙的工程设计和特殊的材料，此外，建筑所在地通常为施工困难且法规严格的区域。因此，超纤细塔楼只有成为豪宅才能产生经济效益。但就市场而言，豪宅也分为普通和高级两种，况且，像曼哈顿这样的房地产市场并不多见。因此，本文将从定义并区分两种超纤细高楼的类型开始，着重研究不同的开发策略：超奢华塔楼（定义为每层仅有1-2间公寓）现仅出现在曼哈顿；及其他所有纤细的高塔楼，该类建筑的每层都设有多间公寓。

约自2007年起，超纤细塔楼便在纽约市不断发展。首先，让我们来看看此类建筑的

Manhattan; and all other tall and slender towers that plan multiple apartments per floor.

First, let's look at the distinctive type of super-slender tower that has evolved in New York City since around 2007. This graphic grid of eighteen renderings and photographs illustrate the new form (Figure 1). Designed by thirteen different architectural firms, these buildings display a range of styles from historical to avant-garde and are clad in the spectrum of materials from limestone panels to all-glass curtain walls. The key characteristics of this new typology are explained in two papers I delivered at previous CTBUH conferences, where I detailed the forces that shape the form – in particular, New York's zoning regulation and transferable air rights, the value of views, the market for exclusivity, engineering solutions, and the per square foot/ square meter platform of buyer's price of \$3,000/ \$33,000 USD. My shorthand phrase for this complicated formula is 'the Logic of Luxury,' and I'll briefly review how the luxury formula works later in this paper.

Keeping Things in Proportion

To be very clear: the defining characteristic of the New York towers is not height, but slenderness. TALL and BIG are not the same thing, and it is important to emphasize that difference, since the two descriptive terms are so often confused by the general public and even by the architectural press. The original World Trade Center North Tower was the tallest building in the world on its completion in 1971. It was also BIG: with an enormous square floor plate of 209 feet / 64 meters on each side and a height of 1,368 feet/ 417 meters, and with 110 stories, it contained a



Figure 1. Top: One57 by Christian de Portzamparc; 111 West 57th Street by SHoP; 432 Park Avenue by Rafael Viñoly Architects; 520 Park Avenue by Robert A.M. Stern Architects; Central Park Tower by AS+GG; 220 Central Park South by Robert A.M. Stern Architects. Middle: 53 West 53rd by Ateliers Jean Nouvel; 100 East 53rd Street by Foster + Partners; 45 East 22nd Street by Kohn Pedersen Fox Associates; One Madison by Cetra/Ruddy; 35 Hudson Yards by Skidmore, Owings & Merrill. Bottom: 56 Leonard by Herzog & de Meuron Architekten; 30 Park Place by Robert A.M. Stern; 111 Murray Street by Kohn Pederson Fox Associates; 125 Greenwich Street by Rafael Viñoly; 50 West Street by JAHN; 9 DeKalb Ave by SHoP. (Source: The Skyscraper Museum from images provided by Christian de Portzamparc; SHoP; CIM Group & Macklowe Properties; RAMSA; New York YIMBY; RAMSA; Hayes Davidson; RFR; ESTO; Williams New York; CetraRuddy; Visualhouse; Alexico Group; RAMSA; Redundant Pix)

图1 上：克里斯蒂安·德·鲍赞巴克设计的One57；SHoP设计的西57街111号；拉斐尔·维诺里建筑师事务所设计的帕克大道432号；罗伯特·斯特恩建筑师事务所设计的派克大街520号；AS+GG设计的中央公园塔；罗伯特·斯特恩建筑师事务所设计的中央公园南220号中；让·努维尔工作室设计的西53街53号；福斯特合伙人事务所设计的东53街100号；KPF建筑设计事务所设计的东22街45号；Cetra/Ruddy设计的麦迪逊1号；SOM设计的哈德逊园区35号下；赫尔佐格·德穆龙建筑师事务所设计的莱昂纳多56号；罗伯特·斯特恩建筑师事务所设计的公园广场300号；KPF设计的莫雷大街11号；拉斐尔·维诺里建筑师事务所设计的格林威治街125号；JAHN设计的西街50号；SHoP设计的迪卡尔布大街9号。（来源：The Skyscraper Museum from images provided by Christian de Portzamparc; SHoP; CIM Group & Macklowe Properties; RAMSA; New York YIMBY; RAMSA; Hayes Davidson; RFR; ESTO; Williams New York; CetraRuddy; Visualhouse; Alexico Group; RAMSA; Redundant Pix)

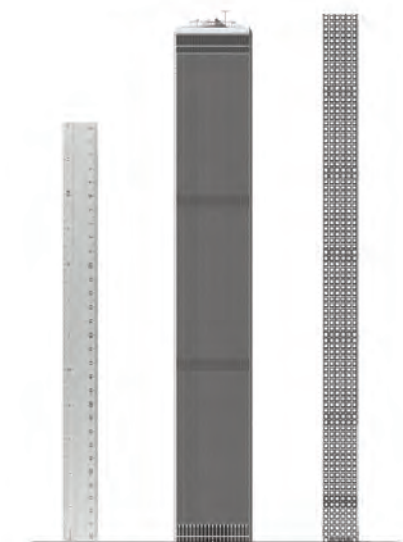


Figure 2. Tall, but not slender: a comparison between 432 Park Avenue and the former 1WTC.

图2 高但不纤细：公园大道432号和之前的1WTC之间的对比

gross floor area of more than 4 million square feet/ 371,162 square meters. But its base-to-height ratio was less than 1:7, so it was only moderately slender. The new residential tower in New York, 432 Park Avenue, has a roof height taller than the original World Trade Center (and a height of 1,396 feet/ 425 meters) and a base that is only 93 ft. /28.3m. Thus its slenderness ratio is 1:15 (Figure 2).

The new New York superslims have attracted substantial publicity and pointed criticism

特点。这张平面网格内有18张透视图和照片，展现了这种新的形式（图1）。这些建筑分别由13家不同的建筑事务所设计而成，设计风格从古典到前卫，不一而足。建筑外层材料从石灰石板到全玻璃幕墙，各不相同。我在之前的《世界高层建筑与都市人居学会》会议上递交了两份论文，其中便解释过这种新类型的关键特性，我还详细介绍过形成此类型的推动力——尤其是纽约的分区分法规和可转让的空间所有权、景观价值、由追求独占性形成的市场、工程设计解决方案及每平方英尺3000

for their high prices and extraordinary height and especially for the length of the shadows that they cast on the public space of Central Park. But in fact, not many are “supertall” by CTBUH standards, i.e., 1,000 feet/ 305 meters or taller. At present, there are only two New York towers that stretch above that limit: One 57 and 432 Park Avenue – although five more are underway. A chart of silhouettes made by The Skyscraper Museum of the same eighteen tall, thin towers in Figure 1 (ones that were either completed or in early stages of construction in May 2016) clearly shows the characteristic slenderness of the new type (Figure 3). All the buildings on our chart have slenderness ratios of 1:10 or higher. The shortest and earliest, Sky House, completed in 2007, is just under 600 feet/ 182 meters. The future tallest will be Central Park Tower at more than 1500 feet/ 457 meters (although it should be noted that this building is a mixed-use structure and really does not belong in the line-up). The project with the highest slenderness ratio– an extraordinary 1:23 – is the feather-thin 111 W. 57th Street, designed by architects SHoP and engineers WSP, where the tower measures a mere 59 feet by 79 feet (19 meters by 24 meters) in plan and will rise to 1,438 feet/ 438 meters at the tip of its ornamental crown. Again, let me underscore that 111 West 57 is very tall, but not at all BIG in terms of floor area: the gross floor area of the 80-story structure will only be 316,000 square feet, or 29,351 square meters.¹

Sky Living

Inspired perhaps by New York, tall, thin residential towers of 80 to 100 stories have recently begun to pop up in many cities worldwide. Again, the focus of this paper is slenderness, not height, but if we do detour

美元（合每平方米33000美元）的购买价格。对于这一复杂的公式，我简称为“奢华的逻辑”，在后文我将简要地回顾这种奢华公式的运作原理。

理性对待

要明确的一点是，纽约高楼的特点不在于高度，而在于纤细度。高和大的涵义并不相同，强调二者的差异十分必要，因为公众甚至一些建筑行业出版社也经常将这两个描述性词语相混淆。最初的世界贸易中心北塔（World Trade Center North Tower）于1971年竣工，是当时的世界第一高楼。它的建筑体量也很大：巨大的正方形基座边长209英尺（约合64米），高度为1368英尺（约合417米），共有110层，总建筑面积超过400万平方英尺（合371,162平方米）。但它的高宽比还不到7，所以，只能说该建筑较为纤细。纽约新的住宅塔楼公园大道432号（432 Park Avenue）的屋顶高度超过了最初的世界贸易中心（高度为1396英尺或425米），基座边长却仅有93英尺（合28.3米），其高宽比高达15（图2）。

纽约内新出现的超纤细建筑已吸引到了绝大多数公众的注意力，并因其高造价、超高度，尤其是它们投射在中央公园公共区域的影子长度而招来了批评。但事实上，根据《世界高层建筑与都市人居学会》标准，即1000英尺（合305米）或以上来说，并没有太多的建筑可被描述为“超高”。目前，仅有两座纽约高楼超过了该标准——One 57和公园大道432号住宅大楼，尽管另有五座建筑即将建成。摩天大楼博物馆（Skyscraper Museum）为图1中的18座高挑塔楼（在2016年5月无论是建成或在施工初期的建筑）绘制了轮廓图，清晰地展示了这种新类型建筑的纤细特性（图3）。我们图中所有的建筑的长细比为1：10或更大。空中之屋

（Sky House）于2007年竣工，建成时间最早，但高度却最低——不足600英尺（合182米）。未来最高的建筑为中央公园塔（Central Park Tower），它的高度超过1500英尺（合457米）（但应注意该建筑为综合体结构，其实并不属于住宅楼这一范畴）。目前长细比最大的建筑是西57街111号（111 W. 57th Street）住宅大楼，其比例高达1：23，几乎像羽毛一般纤薄，的确非同凡响。该建筑由SHoP建筑师们和维斯平（WSP）工程师们共同设计。根据平面测量的结果显示，该塔楼占地面积仅有59英尺乘79英尺（合19米乘24米），但从它的冠饰顶端开始测量的话，其高度就达到了1438英尺（合438米）。让我再强调一下，西57街111号大楼的确很高，但建筑面积并不大：80层建筑的总建筑面积仅为31.6万平方英尺（合29351平方米）。¹

云端生活

80–100层的高瘦型住宅塔楼最近已开始在全世界多个城市涌现，可能是受到了纽约的启发。重申一次，本文关注的是纤细度，而非高度，但如果我们稍微离题探讨下“云端生活”的对象及其吸引力，我们从超高住宅塔楼的历史中又能发现什么呢？

事实上，这段历史相当短暂。纽约摩天住宅楼的早期历史可能追溯到20世纪20年代中期，当时的绘图师休·费理斯（Hugh Ferriss）和雷蒙德·胡德（Raymond Hood）等建筑师们对高层建筑大加赞赏。“顶层公寓”（penthouse）一词最开始指的就是这些最昂贵的顶层公寓，而非高层建筑的顶层机械结构。当时，摩天大楼中仅有的“公寓”都位于酒店内，原因是最迟到1929年，纽约州出台了一系列经济公寓立法对公寓建筑进行管理，其中规定建筑高度不得超过150英尺。但1916年的分区法规允许“25%的塔楼”可以加高，因此，按照1916年分区法规后置公式的要求对塔楼进行修建后，作为商业建筑的摩天豪华酒店纽约荷兰雪梨酒店（The Sherry Netherland）等便拥有了耸立云端的高度。1929年后，修订后的《多户公寓法》（the Multiple Dwelling Law）允许公寓住宅楼创建新型的奢华生活，如圣雷莫的双子塔和中央公园西的埃尔多拉多（El Dorado）大楼提高人们的生活水准。在20世纪20年代末，甚至在20世纪30年代经济大萧条时期，纽约的顶层公寓、屋顶露台以及彩虹屋（Rainbow Room）的魅力都

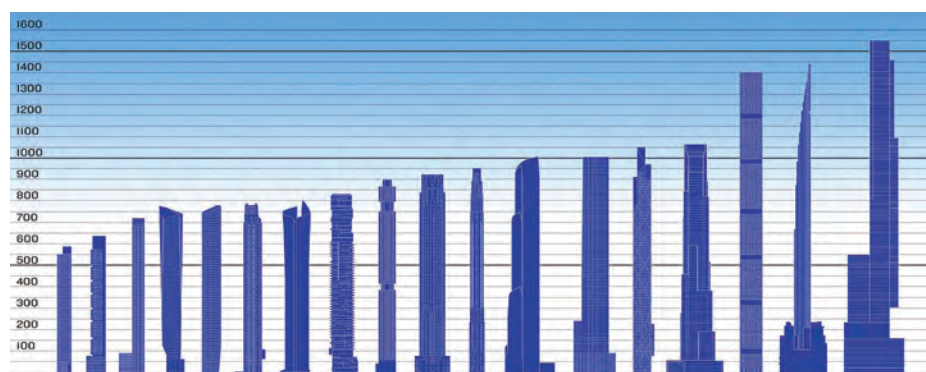


Figure 3. New York City's super-slender residential skyscrapers. (Source: : The Skyscraper Museum)
图3. 纽约超纤细住宅摩天大楼。（来源：摩天大楼博物馆）

1: Defining “slender” can be complicated. Some of the silhouettes in the Figure 3 chart are rather fat or have thicker bases with a slim upper shaft: this is generally a function of combining a commercial section, either of a hotel or a retail space such as a department store, on the lower stories, as with One 57 and Central Park Tower. Others with two dramatically different profiles, such as 220 Central Park South, are almost slabs.

1: 补充说明：为“纤细”下定义并不是一件易事。如果图3表中一些建筑的上方并道较为修长，其建筑轮廓则相对较胖，或是说较宽，这通常是因为商业区在较低楼层与酒店或与百货商店等零售空间相整合，由此而出现的一种功能，One 57和中央公园塔就符合这种特点。而其他具有两种明显不同轮廓的建筑基本为平板建筑，中央公园南220号大楼（220 Central Park South）便是其中一种。

briefly to explore the subject and appeal of “sky living,” what can we say about the history of very tall residential towers?

Actually, that history is fairly short. In New York, it's possible to trace the early romance of skyscraper domiciles to the mid-1920s when the delineator Hugh Ferriss and architects such as Raymond Hood sang the praises of elevated aeries, and the word “penthouse” first began to refer, not to the rooftop mechanical structures of a high-rise, but to the highest-priced apartments on top floors. At that time, the only “apartments” in skyscrapers were in hotels, because, until as late as 1929, apartment buildings were regulated by New York State tenement house laws, which set maximum heights at 150 feet. As commercial architecture, though, posh skyscraper hotels such as the Ritz and Sherry Netherland had soaring tower sections shaped by the setback formula of the 1916 zoning law which allowed “25 percent towers” to rise to unlimited height. After 1929, a revision of the Multiple Dwelling Law allowed apartment houses such as the twin-tower form of the San Remo and El Dorado on Central Park West to establish a new standard of luxury living. In the late 1920s and even Depression-era 1930s, New York penthouses, rooftop terraces, and Rainbow Room glamor became a sign of wealth and sophistication, featured in magazines and Hollywood movies.

Unprecedented heights of sky living became possible in post-war Chicago when mixed-use modernist towers such as the 100-story John Hancock Center (1969) and 78-story Water Tower Place (1976) developed apartments on their upper floors. These slab buildings found their aesthetic in rationalist exercises in engineering, not in the fancy finials of prewar Manhattan spires. (It should be noted, though, that the 65-story scalloped cylinders of Marina City, designed in 1959 and completed in 1964, pioneered Chicago's important innovations in high-rise residential complexes.) Today, Chicago has many apartment buildings of 800 feet/ 244 meters or taller, and more on the way, but only one resembles a slender tower in form, the 1998 Park Tower.

In New York, the next wave of skyscraper residences began with the rise of the luxury condominium tower. While the history of condos in New York can be traced back to the mid-1970s, the boom of high-rise condominium development came in the mid-1980s and centered especially around Fifth Avenue and 57th Street, spurred by a revision of the zoning law in Midtown West that encouraged mixed-use building and offered developers bonus floor space for providing privately-owned-public-space (POPS) such as plazas or atriums. Upscale projects included the

716-foot/ 218 meter Metropolitan Tower (1987) and 814-foot/ 248 meter CitySpire (1987), which became the tallest residential buildings in the city. These towers were also the first to use slenderness as a strategy to achieve greater height and views by taking advantage of the provisions of the 1961 zoning law that for allowed the purchase and transfer of unused air rights. In the 1990s, some Post-modern spires such as Trump Palace and the Zeckendorfs' 515 Park Avenue (2001) intentionally evoked the romantic hotel towers of the Twenties. In 2001, Trump World Tower, which combined the minimalist slab with a very thin side of true engineers' slenderness, became the city's tallest residential building at 861 feet/ 262.4 meters.

Placed on hold by the traumatic events of 9/11, New York development stayed away from lofty towers for about five years while critics and the community, and especially lenders, debated whether people would ever return to living, or even working, in skyscrapers. But the success of projects begun before 9/11, such as the Time Warner Center and 15 Central Park West, as well as escalating demand from wealthy New Yorkers and global investors, fueled the market for new luxury towers – at least until the banking crisis of 2007-08. During this time, around 2005-2007, several of the ultra-luxury, super-slender towers of our study were proposed, including: One 57; 56 Leonard; 100 East 53 Street; 50 West Street; and the first scheme for the MoMA tower, designed to be 1,250 feet / 381 meters tall, which was cut down to 1,050 feet / 320 meters during its City Planning Commission review. The pent-up demand for luxury condos during the four-to-five year slowdown in supply drove prices for the first completed super-slenders to stratospheric heights and has fueled a mini-boom of the form. There has been much debate on whether demand will continue.

The Sprawl of Tall

Where else in the world have very tall, thin towers of 80 to 100 or more stories caught on? To do a survey, we need a metric for the category. Since developers in their marketing often exaggerate the number of floors, “stories” is not a reliable indicator of height. As we know from CTBUH committees, there are at least three ways to measure vertical height, so that metric is also complicated. The Skyscraper Museum picked the convenient American unit 800 feet (243.84 meters) to draw our line for inclusion in the survey. But to hammer home a point: that number is both arbitrary and flawed. Height is often a misleading measure, and we should remember that all buildings have at

是财富和高雅的标志，曾多次出现在杂志和好莱坞电影中。

在战后的芝加哥，云端生活出现了史无前例的高度，在当时，100层高的约翰·汉考克大厦（John Hancock Center）（1969年）和78层高的水塔大厦（Water Tower Place）（1976年）等现代综合体塔楼在其高层设置了公寓。这些平板建筑所绽放的美感在于理性客观的工程设计，而非战前曼哈顿高塔上华丽的尖顶饰物。（但应说明的是，设计于1959年、竣工于1964年的马里纳城65层高扇形筒楼在超高住宅建筑中远远领先于芝加哥的各项重要创新项目。）如今，芝加哥许多公寓建筑的高度都达到了800英尺（合224米）甚至更高，而且还有更多即将完工，但只有一座建筑符合纤细塔楼的形态，那就是1998年建成的公园塔（Park Tower）。

在纽约，新一轮摩天住宅大楼随着奢华共管公寓塔楼的崛起而开始涌现。纽约共管公寓的历史可追溯到20世纪70年代，超高共管公寓塔楼在20世纪80年代中期蓬勃发展，尤其集中在第五大道和57街。推动这一现象发展的是中城西区的分区法规，政府鼓励开发综合体建筑并向开发商提供了额外的建筑面积，以提供如广场或中庭等私有公共空间（POPS）。包括716英尺（合218米）高的大都会大厦（Metropolitan Tower）（1987年）和814英尺（合248米）高的城市尖塔（CitySpire）（1987年）在内的高档项目成为了该市最高的住宅建筑。这些塔楼也首次采用纤细度作为实现更高高度的策略，1961年分区法规规定允许购买并转让未使用的空间所有权，这些建筑也正是利用了这些条例。在20世纪90年代，一些后现代尖塔如川普大厦（Trump Palace）和位于公园大道515号的齐肯多夫大厦（Zeckendorfs' 515 Park Avenue）（2001年）有意复兴20年代的传奇酒店建筑。2001年，川普世界大楼（Trump World Tower）采用了最低限度的平板，实现了极高的纤细度，达到了工程的极限，以861英尺（合262.4米）的高度成为了该市最高的住宅建筑。

受到了911事件惨痛教训的影响，纽约的城市开发遭到了搁置，约有五年的时间未建设过高层塔楼。与此同时，评论家和社区，尤其是贷款人都在激辩人们是否愿意重返摩天大楼生活，甚至是工作。但在911事件之前开始的成功项目如时代华纳中心（Time Warner Center）和中央公园西15号（15 Central Park West）也不断提高了纽约富人和投资人的需求，从而推动了新式奢华塔楼市场的发展，这一现象至少延续到2007–2008年的金融危机。约在2005–2007年期间，计划开发几座超奢华、超纤细的塔楼，我们也曾对其研究过，其中包括One 57大厦、伦纳德街56号（56 Leonard Street）住宅楼、东53街100号（100 East 53 Street）住宅楼、

least four significant dimensions: height, width, length, and floor area.

Using the excellent CTBUH Skyscraper Center database, The Skyscraper Museum sorted a group of all-residential buildings worldwide of 800 feet or taller. As of June 2016, there were 63, of which 23 are in Dubai. The remaining 40 are spread across twenty cities, which possess only one to four towers each, except Busan, South Korea, which has five. Indeed, in the category of exclusively residential buildings (versus mixed-use with a residential component), there are currently only three completed buildings in New York that qualify: 432 Park Avenue; 8 Spruce Street; and Trump World Tower. If one also counts buildings under construction, there are at least eight more. The main cities worldwide where height is allowed and the market is driving up prices and floor counts are Dubai, Brisbane, Melbourne, Toronto, and Mumbai. This list leaves aside for the moment the special case of Hong Kong, where point towers and vertical density have long been the standard solution for housing of all classes. Despite the extraordinary proportional slenderness of its pencil towers, only four Hong Kong buildings top the 800-foot benchmark.

The key place in the world, besides Manhattan, that has very deliberately worked to become the capital of tall and thin is Dubai. From its first phase of skyscraper development around 2000, with the Emirates Towers and Burj al Arab, and slightly later, of course, with Burj Khalifa, superlative height has been a part of Dubai's brand strategy. It has more buildings of 300+ meters of any city in the world: currently eighteen to New York's second-place seven. Dubai has 23 residential towers taller than 800 feet/ 244 meters, of which nine exceed 1,000 feet/ 305 meters.² The latter group of nine, which are represented in silhouettes in the chart in Figure 7, are surprisingly similar variations of pencil towers. Eight can be seen one photograph of Dubai Marina, which has become well known for the epithet of "the tallest block in the world." (Figure 4). Rising straight up, most have a square-ish or octagonal plan that measures from about 32 to 40 meters. Facades are patterned compositions of glass and opaque-colored cladding that shield the interiors from the hot desert sun. Ornamental tops distinguish the towers and give additional height. The tallest is Marina 101 with a height of 1,399 feet/ 426.5 meters, which is 3 feet taller than Manhattan's 432 Park Avenue. (Technically, Marina 101 is mixed-use, since its bottom 33 floors are hotel rooms, but



Figure 4. Dubai Marina, "Tallest Block in the World" Seven of the Dubai Marina Supertalls, from left: Ocean Heights, Marina 101, Elite Residence, The Torch, Princess Tower, Damac Heights, Cayan Tower. (Source: Ji Zhang, Flickr)

图4. “世界最高街区” 迪拜码头。7座迪拜码头的超高层，从左起依次：海洋高地大厦，港湾 101，精英公寓，火炬大厦，公主塔，达马克高地大厦，卡延塔。（来源：Ji Zhang, Flickr）

西街50号（50 West Street）住宅楼以及为纽约现代艺术博物馆（MOMA）塔楼设计的首个方案，该方案中原本的设计高度为1250英尺（合381米），但在城市规划委员会的审查中被要求降低为1050英尺（合320米）。奢华共管公寓经历了四五年的建设放缓，市场需求被压制，于是造成首座竣工的超纤细建筑售价飙升至最高，也推动了该类型建筑短暂的繁荣发展。人们也曾就需求是否将持续增长进行过多次讨论。

高度的无限延伸

世界上还有其他地方流行80至100层甚至更高的超高纤细塔楼吗？为了进行这项研究，我们需要为此类建筑设定一个衡量标准。由于开发商们在营销宣传中经常对楼层数夸大其词，因此，“楼层数量”并不是一个可靠的高度指标。我们从《世界高层建筑与都市人居学会》了解到，测量垂直高度的方法至少有三种，所以，衡量标准也并不简单。为了方便起见，摩天大楼博物馆选择将美制800英尺（合243.84米）定为标准，为我们的研究划定范围。我们应记住，所有建筑都至少拥有四种重要的维度：高度、宽度、长度和建筑面积。

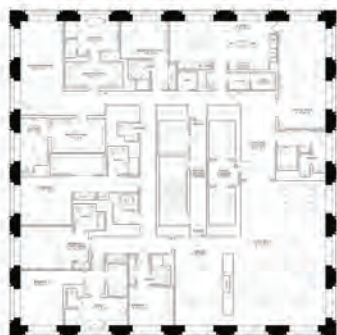
借用《世界高层建筑与都市人居学会》庞大的摩天大楼中心数据库，摩天大楼博物馆从全世界的建筑中筛选出了一组高度至少为800英尺的全住宅建筑。截至2016年6月，此类建筑有63座，其中23座位于迪拜，剩下的40座建筑分别位于二十座城市，每座城市仅拥有1至4座塔楼，但韩国釜山是一个特例，拥有5座。的确，在高档住宅建筑一类（同具有住宅功能的综合体建筑相比）中，纽约目前仅有3座竣工的建筑符合要求——公园大道432号大楼、云杉街8号（8 Spruce Street）大楼和川

普世界大楼。如果再加上还处于施工中的建筑，则至少还另有8座。全世界各大城市中，对高度没有限制、且市场正炒高价格和楼层数的城市主要为迪拜、布里斯班、墨尔本、多伦多和孟买。这份名单暂时不考虑香港的特殊情况，一直以来，香港为各个阶层设定的标准住宅方案都是高垂直密度的尖顶塔楼。尽管香港铅笔式塔楼的长细比非同凡响，但仅有4座香港建筑达到了800英尺的高度标准。

除曼哈顿以外，迪拜是世界上另一处核心地区，一直以来都致力于成为高瘦建筑之都。2000年左右起是迪拜开发摩天大楼的第一阶段，建成了阿联酋塔楼（Emirates Towers）和迪拜帆船酒店（Burj al Arab），当然，还有稍晚建成的哈利法塔（Burj Khalifa）。自那时起，极致的高度一直都是迪拜品牌战略的一部分。它拥有的超过300米高度的建筑数量比任何一座城市都要多：目前，迪拜有18座，而纽约只有7座，屈居第二。迪拜拥有23座高度超过800英尺（合244米）的住宅塔楼，其中有9座建筑的高度超过了1,000英尺（合305米）。² 图7中的轮廓图展现的便是后者的9座建筑，这些建筑与铅笔式塔楼区别甚微，令人称奇。在一张迪拜码头（Dubai Marina）的照片中可看见其中8座建筑，因而以“世界最高建筑群”而闻名于世（图4）。大多数建筑拔地而起，从地面起约32–40米的高度测量来看，这些建筑在平面图上呈现出类似正方形或是八角形的形状。外立面为由玻璃和不透明覆层混合而成的花纹材料，可避免室内受到沙漠酷热阳光的直射。顶部装饰物让各个塔楼之间有所区别，此外还额外增加了高度。港湾101大楼高度为1399英尺（426.5米），现为最高建筑，比曼哈顿的公园大道432号大楼还高出3英尺。（从技术层面来说，港湾101大楼的底部33层为酒店房间，应为综合体建筑，但其外形完全符合住宅塔楼的标准。）公主塔（Princess Tower）高

2: This number counts Marina 101, but not the stalled Marina 106.

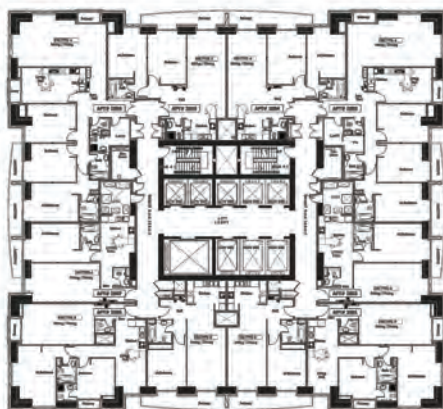
2: 补充说明：该统计包含了港湾101大楼（Marina 101），但未包含施工停顿的港湾106大楼（Marina 106）。



432 Park Avenue

New York City, NY

93 x 93 Feet / 28.3 x 28.3 Meters
8,649 Sq.Ft / 28.3 Sq.M.



Princess Tower

Dubai, UAE

113.5 x 124 Feet / 34.6 x 37.8 Meters
14,074 Sq.Ft / 37.8 Sq.M.



Figure 5. The 432 Park Avenue and Princess Tower floor plans at the same scale. (Source: Rafael Vinoly Architects and CIM Group & Macklowe Properties; CTBUH Skyscraper Center Database)

图5. 公园大道432号和公主塔的等比例楼层平面图。(来源: Rafael Vinoly Architects and CIM Group & Macklowe Properties; CTBUH Skyscraper Center Database)

its form is that of a purely residential tower.)
The tallest all-residential building is the domed Princess Tower at 1,356 feet/ 413.4 meters, which is 40 feet shorter than 432 Park Avenue.

度为1356英尺(合413.4米), 现为迪拜最高的全住宅建筑, 公园大道432号大楼比它要高出40英尺。

Dubai's pencil towers look astoundingly thin when viewed in photographs, but compared at scale to New York's super-slenders, they have significantly greater girth. The main reason for this difference can immediately be understood by comparing typical floor plans of apartments of 432 Park Avenue and Princess Tower (Figure 5). Ultra-luxury Manhattan penthouses occupy an entire floor, and throughout the tower, two units per floor is usually a maximum. There are only 104 apartments at 432 Park Avenue, while in the Princess Tower, there are ten units per floor and 763 apartments in total. This multiplicity of units requires larger floor plates to accommodate extra elevators to handle the volume of traffic and a large central core devoted to mechanical systems and shared hallways. A comparison of four Dubai Marina towers shows full-floor plans that range in width from around 32 to 38 meters and central cores with six or eight elevator shafts, large mechanical rooms, and common corridors. Shown in Figure 6 are, clockwise from top left: Marina 101, which contains 506 apartments (and 281 hotel rooms); The Torch with 676 apartments; 23 Marina with 289 apartments; and Ocean Heights with 519 apartments.

Supertall Residential Towers Worldwide: Two Types

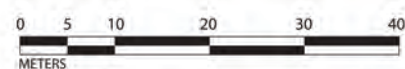
The dramatically different numbers of apartments per building described above

迪拜的铅笔式塔楼在照片中看来是那么的纤细, 不禁令人叫绝; 但在体量方面, 与纽约的超纤细建筑相比, 迪拜建筑的周长相对较长。通过比较公园大道432号大楼和公主塔内公寓的楼层平面图(图5), 我们便能立刻理解形成这种差异的主要原因。超奢华的曼哈顿顶层公寓占据了整个楼层, 而且在整座建筑中, 每层通常最多只有两间公寓。公园大道432号大楼只有104间公寓, 而公主塔每层都有10间公寓, 共有763间公寓。房间数量多就需要更大的楼板, 以承受用于方便上下楼而另设的电梯, 此外, 机械系统和公共通道都需要一面大型的中心核心墙。通过比较4座迪拜海湾塔楼的各自全楼层平面图可知, 建筑的宽度从32至38米不等且中心核心墙上建造的电梯井或6座或8座, 同时还建有大型机房和公共走廊。如图6所示, 从左上方顺时针开始是: 内有506间公寓(和281间酒店房间)的港湾101大楼; 有676间公寓的火炬大厦(The Torch); 有289间公寓的港湾23号大楼(23 Marina); 以及有519间公寓的海洋高地大厦(Ocean Heights)。

Dubai Residential Supertalls



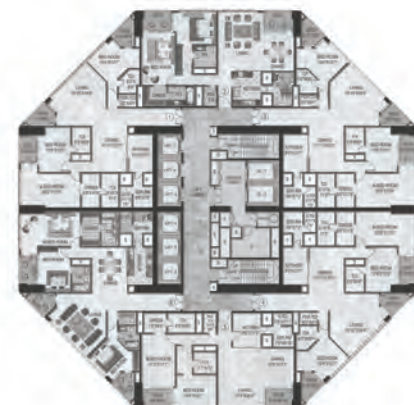
Marina 101



The Torch



Ocean Heights



23 Marina

Figure 6. Four comparative Dubai floor plans: Marina 101, The Torch, Ocean Heights, 23 Marina. (Source: Sheffield Holdings, Dubai Select Property, Metropolitan Premium Properties, Future Homes Dubai)

图6. 4座有可比性的迪拜塔楼楼层平面图: 港湾101、火炬大厦、海洋高地大厦、港湾23号大楼。(来源: Sheffield Holdings, Dubai Select Property, Metropolitan Premium Properties, Future Homes Dubai)

Slim Supertall Residential Towers Worldwide

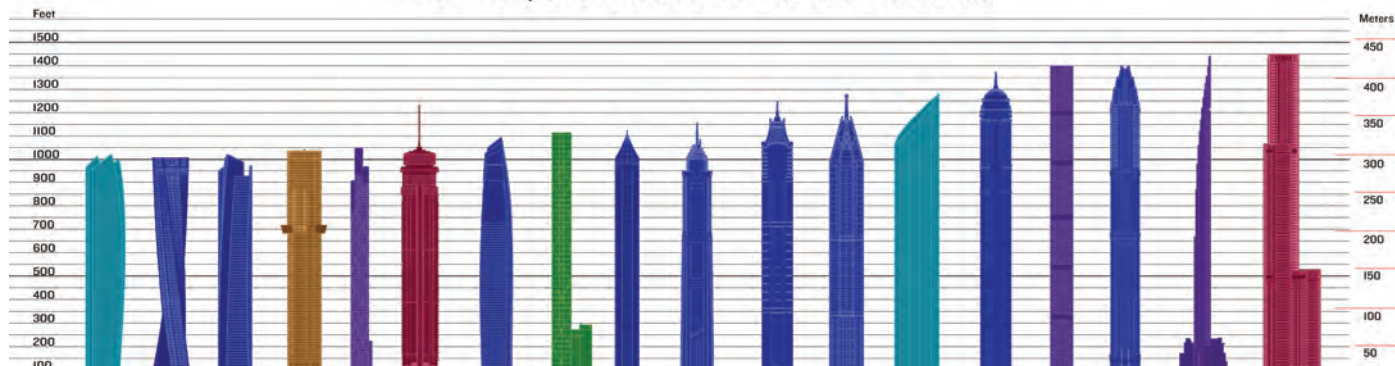


Figure 7. Supertall Residential Towers Worldwide. From left: Etihad Towers T2; Cayan Tower; Ocean Heights; Australia 108; 53W53rd; Omkar 1973 Worli Tower B; Damac Heights; The One; Ahmed Abdul Rahim Al Attar Tower; The Torch; Elite Residence; 23 Marina; Burj Mohammed Bin Rashid; Princess Tower; 432 Park Avenue; Marina 101; 111 West 57th Street; World One. (Source: The Skyscraper Museum, based building silhouettes, courtesy CTBUH Skyscraper Center Database)

图7. 全球超高层住宅塔楼。左起依次为：阿提哈德塔T2、卡延塔、海洋高地大厦、澳大利亚108大楼、53W53rd大楼、Omkar 1973 Worli 塔 B座、达马克高地大厦、The One大楼、Ahmed Abdul Rahim Al Attar大楼、火炬大厦、精英公寓、港湾23号大楼、Burj Mohammed Bin Rashid大楼、公主塔、公园大道432号、港湾101、西57街111号、World One大楼。（来源：The Skyscraper Museum, based building silhouettes, courtesy CTBUH Skyscraper Center Database）

show that Dubai supertalls and New York's tallest super-slenders are disparate types that share only the characteristic of height. This can clearly be seen in a line-up of silhouettes that includes all the residential supertalls, buildings of 1,000 feet/ 305 meters or taller, completed or under construction worldwide (Figure 7). There are just eighteen, and they are color-coded by country: Dubai is represented in blue; Abu Dhabi in blue-green; New York in purple; Mumbai in red; Australia in gold; and Toronto in green.³ It is easy to pick out the New York buildings even without color: they are singularly slender. The less-svelte proportions of Dubai towers are equally characteristic of all the other supertalls because they follow the same model of multiple units per floor and towers with hundreds of apartments. At the far right of the chart is 117-story World One, the soon-to-be tallest all-residential building in the world, still under construction in Mumbai, which will stretch to 442 meters/ 1,450 feet and contain 290 apartments. In Melbourne, the tower called Australia 108, just beginning construction, will rise 100 stories and contain more than 1,100 apartments: a typical floor plan of stories 44-56 shows eighteen apartments per floor. All of the towers outside of New York are designed with a high-end, but mass-market strategy: they are pret-a-porter to Manhattan couture.

New York's super-slender towers, in contrast, are predicated on exclusivity. As I argued in detail in my two previous CTBUH papers on "The Logic of Luxury," the New York type is ultra thin because developers use a strategy of exclusivity to design and sell apartments. Ideally, there are one or two units per floor, which allows for a very tight core, often with only two elevator shafts. An owner steps from

a "private" elevator directly into the apartment with its expansive windows and stunning views. Extra-high ceilings, while a talking point of luxury features, also ensure an efficient plan by allowing for switch-back scissor stairs that reduce the service area of the core, and at the same time make the entire structure some 20 percent taller than it would be with more standard slab-to-slab ceiling heights, thus lifting all apartments a bit higher in the sky. There are numerous other strategies employed in "the logic of luxury," but the bottom line is that slenderness pays: recently that rate has been between \$5,000 and \$10,000 a square foot.

What makes these New York towers so expensive is, in the simplest sense, the price of land. There is a limited supply of land (and air rights) in the most prized areas, and the lots themselves are subject to an ultimate constraint of a maximum amount of floor area allowed under the zoning code. From the point of view of the condo buyer, there is a limited supply of trophy properties (the best views, best address, etc.) that have appeal to collectors and investors in the same arena as the art market. Why shouldn't a live-in picture window of a panorama of Central Park be worth the price of a Picasso or a Pollack?

Is there any other place like New York, which spawns slender towers as a logical expression of its local character and constraints? Well, yes, Hong Kong! Slenderness is a defining characteristic of Hong Kong's tall buildings, and the city has more point towers than any place in the world, as any photograph of the Mid-levels attests (Figure 8). Hong Kong's high land values and liberal zoning laws produced many

全世界超高住宅塔楼两种类型

上述提及的各个建筑的公寓数量差异颇大，这表明迪拜的超高建筑和纽约的最高超纤细建筑是两种完全不同的类型，二者仅在高度上存在共同之处。在全世界范围内不管竣工与否，高度在1000英尺（合305米）或以上超高住宅建筑的轮廓图尤为能体现这一点（图7）。图中共有18座建筑，分别用不同的颜色来代表所在国家：蓝色代表迪拜；蓝绿色代表阿布扎比；紫色代表纽约；红色代表孟买；金色代表澳大利亚；以及绿色代表多伦多。³ 其实，不用颜色也能很容易地找出纽约的建筑：总是极其纤细。迪拜塔楼与其他所有超高建筑都因采用了同样的形式，楼内每层都设有多户，公寓数量达到了上百间，建筑的长细比较小，这是它们的共性。图中右



Figure 8. Hong Kong's mid-level residential district on the slope of Victoria Peak. (Source: Wyliepoop, Flickr)

图8. 从太平山的山坡上看香港半山住宅区。（来源：Wyliepoop, Flickr）

3: This group of 18 has some uncertainty: the Toronto building, The One, maybe be trimmed to 998 feet/304 meters in the planning approval process, and another New York City tower, 125 Greenwich Street, currently under construction, has had variable reports on height, sometimes over 1,000 feet/305, though as of June 2016, the developer's website states a height "almost 1,000 feet into the sky."

3: 补充说明：这组18座建筑的高度并不确定：多伦多建筑The One的高度在规划审核过程中可能被修改成998英尺，还有纽约塔楼格林威治街125号大楼（125 Greenwich Street）目前处于施中，多家媒体对此进行报道，但宣传的高度不一，有的甚至超过了1000英尺，然而开发者的网站在2016年6月宣布高度“接近1000英尺，耸入云霄”。



Figure 9. LOHAS Park, Hong Kong (Source: CTBUH Skyscraper Center Database)
图9. 香港的日出康城 (来源: CTBUH Skyscraper Center Database)

districts of extraordinarily slender and densely packed apartment towers where hundreds of speculatively developed apartment buildings exploited the city's permissible maximum FAR of 1:18. But few of these buildings top 600 feet / 183 meters, and as previously noted, only four exceed our 800-foot benchmark (and only one of these, Highcliff, is truly slender). In Hong Kong, "vertical density" is a mass-housing solution, as can be seen in the dispersed developments of the New Territories, where dozens of nearly identical tall, thin 50+-story towers are planned and built by large developers in cooperation with MTRC, the Mass Transit Railway Corporation Limited (Figure 9). Obviously, the term "exclusivity" does not apply to any of these buildings.

What of slenderness and luxury in Hong Kong? The one example (or really two) is the unmatched pair of towers Highcliff and Summit, which stand apart as isolated "chopsticks" on the mountainside above Happy Valley (Figure 10). The 73-story Highcliff rises 828 feet / 252 meters and boasts a slenderness ratio of 1:20, which means it is still the most slender residential skyscraper in the world, until 111 West 57th Street exceeds it at 1:23.⁴ Completed in 2003, Highcliff is well known as one of Hong Kong's most expensive apartment buildings, but it has not become a model for more isolated and individualistic super-slender towers. It remains a prototype without progeny in Hong Kong.

Conclusions

What is the takeaway of this analysis and differentiation of supertalls and super-slenders? That they are not the same thing. Because an aggressive market exists in many cities for high-end properties, there will certainly be more supertalls in places where municipal

边远处是孟买117层的World One大楼，仍处于施工中，即将成为世界上最高的全住宅建筑，高度将延伸至442米（合1450英尺），内有290间公寓。名为澳大利亚108大楼(Australia 108)的墨尔本高楼在施工初始，计划未来楼层数将达到100层，公寓数量将超过1100间。而44-56层普通建筑的平面图中，每层的公寓数量仅为18间。除纽约外的所有塔楼在设计时都采用高端但面向大众市场的策略。与曼哈顿手工定制的服装店截然相反，它们就像是工业化的成衣店。

相比之下，超纤细塔楼素来以独有性出现在纽约的市场上。在之前发给《世界高层建筑与都市人居学会》两篇论文中，我详细论述过“奢华的逻辑”这一主题。正如我在文中所述，纽约的建筑之所以是超纤细的形态是因为开发商们在设计和销售时都在宣扬公寓的独有性。在理想的情况下，每层仅有1间或2间公寓，这就需要考虑将核心墙设计得十分紧凑，通常只需要两座电梯井。业主从“私人”电梯走出，直接便可步入拥有巨大窗户和壮丽美景的公寓。奢华设计的挑高天花板成为了话题，同时，宽敞的空间可以安装回转剪刀式楼梯，这就减少了核心墙的辅助面积，与更为标准的板到板天花板高度相比，整体结构提高了约20%，保证了高效的设计。“奢华的逻辑”还采用了大量其他的策略，但其底线是有助于实现高纤细度：近来房价已介于每平方英尺5000至10000美元之间。

纽约塔楼之所以会如此之贵，简单来说就是地价高。在这个寸土寸金的地方，土地（和空间所有权）资源有限，而地块自身取决于分区法规所允许的最大建筑面积的终极约束。从共管公寓买方的视角看来，超高端房产（最佳视野、最佳地段等）资源有限，但这类资源在艺术市场上已吸引了众多收藏家和投资商。那为什么一扇能看见中央公园全景居住单片落地窗户的价值不应等同于一副毕加索或波拉克画作的价值呢？

纤细塔楼大量的出现在纽约，纽约将其视为对本地特性和限制的自然反应，还有其他地方像纽约一样吗？有，那就是香港！长细定义了香港高层建筑的特性，而这座城市也有着世界上最多的尖顶塔楼，任何一张半山区的照片都能证明这一点（图8）。香港的高地价和民主的分区分法规使得多个行政区拥有极其纤细但人口密度极高的公寓塔楼，这里也开发了上百座投资性质的公寓，充分利用了香港政府允许的最大高宽比18。但鲜少有建筑的高度超过600英尺（合183米），正如前文所述，仅有4座建筑的高度超过了我们设定的800英尺标准（而且其中只有晓庐这一座符合真正意义上的纤细标准）。在香港，“垂直密度”用于解决群体住房的问题，新界的分散式规划中也体现了这一点，其中规划了几十座五十多层的塔楼，有着近乎完全一样高度和纤细度，由大型开发商和MTRC（香港地下铁路有限公司）联合建造（图9）。很明显，“独有性”一词并不适用于此处任一座建筑。

那么，香港和纤细度、奢华又有什么关系呢？举一个例子（其实是两个）就是这一对并不匹配的晓庐和御峰（Summit）塔楼，两座楼分开独立，好似伫立在跑马地



Figure 10. Highcliff and The Summit, Hong Kong (Source: Magnusson Klemencic Associates)
图10. 香港的晓庐和御峰 (来源: Magnusson Klemencic Associates)

4: Structural engineers Magnusson Klemencic Associates give 1:20 as the slenderness ratio in their untitled technical paper of 2004 on Highcliff, although it's hard to determine exactly what they are measuring.
4: 结构工程师Magnusson Klemencic Associates在2004年Highcliff一篇未命名的论文中给出了1:20的长细比，虽然他们依据什么进行的测量不得而知。

regulations allow them. And there will be more super-slenders in New York, because the constraints and opportunities of the city's zoning law make the slenderness strategy profitable. But I hope I have also made a larger point about analyzing tall buildings with other dimensions than vertical height. Are you listening CTBUH committees?

(Happy Valley) 山腰上的两根“筷子”(图10)。73层晓庐的高度达到828英尺(合252米),其长细比为1:20,而西57街111号大楼的长细比是1:23,⁴在它建成之前,晓庐仍是世界上最纤细的住宅摩天大楼。

总结

本文分析并区分超高建筑与超纤细建筑的用意为何?是要说明二者并不能混为一谈。由于在许多城市,高端房地产的市场在不断扩大,在一些市政条例允许的地方,必将会出现更多的超高建筑。纽约也将会出现更多的超纤细建筑,该市的分区法规对纤细度策略的限制及其所带来的机遇使得它有利可图。但我希望自己已经解释清楚为什么要使用除垂直高度以外的维度来分析高层建筑。你相信《世界高层建筑与都市人居学会》吗?

References:

The Skyscraper Museum. (2013). **Sky High & The Logic of Luxury**. Available at: http://skyscraper.org/EXHIBITIONS/SKY_HIGH/sky_high.htm (Accessed: 27 July 2016)

The Skyscraper Museum. (2013). **New York's Super-Slenders**. Available at: http://skyscraper.org/EXHIBITIONS/TEN_TOPS/slender.php (Accessed: 27 July 2016)

Willis, C. (2014). **"The Logic of Luxury: New York's New Super-Slender Towers,"** CTBUH 2014 Shanghai Conference Proceedings.

Willis, C. (2015). **"The Logic of Luxury 2.0,"** Global Interchange: Resurgence of the Skyscraper City.