

Miami-Singapore: Establishing a High-Rise Dialogue between Unlikely Tropical Sisters

A route planner for multi-disciplinary comparative studies, tested for the sustainability analysis of high-rise residential concepts

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This paper combines the author's typo-morphological experience in high-rise research with the climate-focused topic of the 2013 Subtropical Cities Conference in Fort Lauderdale. Living and teaching in Miami - over the last five years grown into a showcase of residential high-rise development - he decided to undertake a comparative analysis of new high-rise concepts between Miami and a city of similar environmental and economic conditions. In spite of major differences in numerous parameters, the city-state of Singapore presented itself rather quickly as an appropriate Asian counterpart, specifically regarding sustainability issues.

The paper prepares the ground for a multi-disciplinary type of comparative analysis, and tries to identify the most pertinent study topics rather than to actually discuss or test them. It raises also questions that, at a later stage, might potentially be discarded as not necessarily adding value to the scientific discussion, leaving the traces of the methodology's gradual elaboration. Crucial for this methodology is the combination of formal, cultural and economic perspectives, aiming to achieve a better understanding of a building type that tends since its relative recent birth in Chicago and New York of the 1880s to be immersed in a mystifying cloud made of idle superlatives and ardent ideologies. Supposedly, this paradigm has recently shifted, linked to growing environmental concerns and pressures. Slowly but surely, planners, designers and developers are about to invent a new generation of more sustainable tall constructions.

The scientific problem however is not only the precise definition of "sustainability", neither the sheer analysis of new technological solutions, but, more importantly, the identification of the conditions that favor the actual implementation of green development. What view do we have to adopt and what measures do we have to take in order to avoid that innovative architectural

proposals remain exceptions or do not even leave the drawers? This paper hence tries to build bridges between architectural, urban, structural, socio-economic, cultural and policy-related issues, hoping to identify the relevant questions for research on the “sustainable residential tower in the tropics”.

It overlays a multitude of parameters in order to allow in a following step to proceed towards an isolation of more specific parameters and study questions for in-depth analysis. The author assumes that this preparatory work is necessary in order to help establish a body of knowledge that can be shared with peers. In contrast to a strictly formal approach, it seems improbable that any in-depth and multi-disciplinary analysis can be achieved by a single individual or even a small team.

In the following main part of the paper, the issue of the tropical tower in Miami and Singapore will hence be discussed according to separate categories, trying to prevent an amalgamation of symptoms, causes and consequences as the typical temptation of any complex study object.

MAIN PART

CLIMATE / GEOGRAPHY

The key reason for the here-presented comparison are similar climatic conditions. Miami and Singapore both have a tropical climate, the former one a monsoon (Koeppen Classification *Am*) and the latter one a rainforest climate (Koeppen Classification *Af*). Situated just one degree north of the equator, the Asian City State hardly knows any major seasonal differences: the average temperature fluctuates in a very narrow span between a daily minimum of 72 and a maximum of 92 °F. The average rainfall experiences slightly higher variations, with two wet seasons - in June and November to January, and monthly precipitation between 5.4 and 14 inches.

Miami, situated just north of the Tropic of Cancer and therefore geographically subtropical and not tropical, experiences more variations and essentially two distinct seasons, summer and winter. The summer is not only warmer with maximum monthly temperatures between 77 and 89 degrees °F in August, but has also significantly more precipitation, with a maximum of 9.3 inches in June. January is the coolest winter month, with temperatures between 59 and 75 °F and low precipitation of only 2 inches in average.

In terms of relative humidity, Singapore leads with 61-95% on a daily base and fairly small annual variations. Miami's annual average lies between 49% and 91%, with the lowest figures between February and April.

Both places experience frequent, if not daily thunderstorms during the wet seasons. As a major difference, Miami is situated in a hurricane corridor, a fact that impacts local building codes and construction costs.

In terms of relief, the city-state offers more differentiation and sloped terrain, but a maximum elevation of only 545 feet. The Miami region is essentially flat. Both places entertain a very close relation to nature and especially the sea: Singapore as a small island, and the Floridian metropolis as a linear poly-nodal entity between two National Parks, the Everglades to the west and Biscayne Bay with its islands to the east.

Another, more conceptual and cultural similarity between the two cities can be seen in the considerable impact of man-made structures on nature not

only through buildings and infrastructures, but also through the modelisation of nature itself: large parts of the Singaporian coastline are hence the result of gradually extended infill works, including for example the Marina Bay zone. In the Miami region, not only the beach along South Beach is artificial, but also most of the islands in the afore-mentioned Biscayne Bay were formed as a development initiative in order to maximize waterfront real-estate values. The issue of artifice includes also the vegetation as such, as the visible lushness and tropical flair are in most cases the result of recent landscaping efforts. In their "original state", both regions are despite the lack of harsh winters compared to more temperate zones aggressive to humans.

MAJOR ECOLOGICAL THREATS / CLIMATE CHANGE

Miami

Climate change, and particularly global warming and rising sea levels are a major threat to all of South Florida. This has to do with the shallowness of the terrain, high ground water levels and the hurricane activity. Especially due to the latter point, the increasing unpredictability of natural disasters that can aggravate the averaged forecasts, inundation of urbanized zones threatens not only the coastline, but also areas underneath sea-level in the interior of the land. In view of its tourist- and leisure-dependent economy, heavily relying on the experience of abundant water features and views, the impact of rising sea levels could be particularly dramatic. This will have two major consequences: firstly, the need to reduce CO₂ emissions as part of a globally concerted action, hoping that such a reduction will be sufficient to annihilate the trend. Secondly, the need to elaborate a comprehensive plan and the necessary financial provisions that will lead the city, its inhabitants and economic base successfully through the (probable) scenario that concerted action will not be able to completely stop the rising sea levels. It is evident that this heavy financial commitment presupposes a strong sense of community and the existence of a long-term vision.

Among many additional points, the control of density and traffic is of special importance for the sustainable future of the city. Unlike the former issue, it can more easily be solved on a regional base and can be attributed to sustainability concerns in the wider sense, rather than its at times problematic, strictly ecological definition. A sprawling linear city sandwiched between the Everglades and the sea, Miami will not be able to implement its ambitious growth vision without the improvement of public transport and the densification of existing inner-city areas. The current car dependency does not only create too many CO₂ emissions, but parking issues and traffic jams start to stifle the city's growth potential.

Singapore

The interesting, if not unique feature about Singapore in terms of sustainability is its long-time awareness of the problem. Due to the city-state's tiny size and island position, it can be perceived as a simplified model of the earth. Bare of natural resources, and for economic and political reasons in need of a growing population that cannot be fed through local agricultural means, Singapore had since its official independence from the UK in 1963 to be highly inventive in order to survive. Surrounded by countries, Malaysia and Indonesia, that are current partners, but considered to be less stable and potentially hostile, Singapore tries to achieve a maximum of autarky.

Due to a higher elevation, rising sea levels might be slightly less menacing than in Miami, but the country with the 3rd highest population density in the world (after Macau and Monaco, but before Hong Kong) experiences not only the Urban Heat Island Effect, but essentially all environmental issues that can be expected in an overcrowded place that cannot easily externalize its problems over the next political boundary. This includes fundamental issues like waste management, energy production, energy storage, energy supply, traffic congestion, water management, etc.

LOCAL ARCHITECTURAL AND URBAN HISTORY OF HIGH-RISE

Miami

Despite its young age - founded in 1896 with a population of just 300 people as a result of the southern extension of Henry Flagler's Florida East Coast Railway - Miami has already experienced several waves of high-rise construction. Genuine urban development started only during the short landboom of the 1910s and 1920s, finding an abrupt end with the devastations of the 1926 hurricane. This first generation of tall structures was however designed for commercial, government and hotel uses only. The multi-family residential market of more than three or four stories developed later in the 1960s, most prominently represented through buildings designed by Morris Lapidus in the northern part of Miami Beach. From a morphological point of view it is interesting to note the relation between geography, program and typology for this first generation of high-rise construction, as the more utilitarian developments of the downtown grid tend to completely differ from the flamboyant hotel constructions in South Beach, built during the same time period. The former group appears as a stylistically eclectic, but formally typical infill of an early US-American downtown grid. The latter one, though architecturally not unique, grew in conjunction with the narrow shape of the island and its endless beach into a national trademark for mass tourism.

Concentrating on residential structures, the above-mentioned developments of the 1960s - stylistically still remindful of the Art Deco period - were since the early 1980s superseded by a new generation of high-rise slabs, built along the southern part of Brickell Avenue on long and narrow plots that stretch from the street to the bay. The most famous example of these large constructions is Arquitectonica's Atlantis Condominium, elevated above a ground level parking deck. The difference between this type and the current one is mainly due to the displacement of the development activity towards the historic city center and its banking counterpart on the southern side of the Miami River, the northern and denser part of Brickell. The condominiums of the pre-2008 boom are hence mostly point-towers and not slabs, often over 40 stories tall, and re-appropriate an urban character through the increasingly frequent accommodation of commercial uses in the ground floor of the tower's base. As a concession to Miami's chronic car-dependency, these bases are often made up of up to 10 levels of parking. On larger lots the tower's footprint is considerably smaller than the surface of the parking bases, and the deck is hence used for leisure zones and swimming pools, accessible only to the condominium owners.

In summary it can be said that the Miami case of high-rise construction entertains a more complex and at times contradictory relation towards



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Figure 1: Icon Brickell by Arquitectonica as an example of Miami's tower-on-parking-base typology of the late 2000s

density than its Asian counterpart. If the recent return to the city center seems to follow the founding paradigm of tall buildings ("a machine that makes the land pay" (Cass Gilbert)), many earlier projects suggest due to a particularly low plot coverage that the main motivation to build tall was not the provision of a maximum of units on a given piece of land, but the use of unhindered sea views as a marketing boon.

Singapore

Singapore's architectural history is marked by low-rise constructions. The regional mixture of Chinese, Malay, Dutch and British influences has produced a specific version of the so-called "Chinese Shophouse". The high-rise component, only in very exceptional cases used by the British during their colonial reign, is hence a recent urban feature. Due to the state's exceptional population growth and the importance of public housing as part of Singapore's founding myths, it has however become since the mid-1960s the predominant housing typology, often to the expense of the vernacular heritage. Today, 80% of all inhabitants live in apartment buildings that have been built by the public HDB (Housing and Development Board), over 90% being owner-occupied and not rented. These impressive figures, unique in the world, do explain how strong the local ties are between high-rise development and state policies. Architecturally speaking, it is worthwhile mentioning that Singapore adopted some CIAM (Congrès International d'Architecture Moderne) and Corbusian principles in a specifically orthodox and extreme manner. One reason is certainly the time period of frenzy development after the country's independence in the 1960's, but the other one the simple fact that many of the modernists' precepts and suppositions fitted the local context even more than the one of the countries in which they were developed. France, for example, the resident country of Le Corbusier, experienced in some urban areas major housing shortage, but the overall conditions, the geographic limitation and population growth figures are in no way comparable to Singapore. It is hence not surprising that most French, and for that matter European and US-American high-rise developments do actually not deliver high population densities. In most cases, abundant and relatively cheap land on the outskirts of the city centers made it possible to implement the "tower in park" typology with emphasis on the park notion. In Singapore, the easily predictable lack of territory and the rigid planning grip of the hegemonic PAP (People Action Party), made it right from the beginning clear that density was key. High-rise was declared to be the only option. This relative simplicity of process and action does however not attend with a homogenous architectural product. Even though most residential building activity was and still is controlled by a single entity - working with internal architects on fairly rigid spatial configurations and programs -, the modest quality of the earliest constructions and the rising demands of a rapidly enriching population led also to a very short building life cycle. Today, many slabs and towers have been redeveloped at least once, becoming considerably more sophisticated and offering not only more individual space, but also better communal amenities. Upgrades are frequent, partly motivated by the government's unspoken promise to assure growing prosperity in exchange for political support of the one-party system. As in most capitalist societies, real estate constitutes the major investment value for the largest part of the population. Since the 1980s, the share of private developments has risen, catering to the needs of the best-earning strata of society that is not entitled to public housing, and those that

are seeking alternative solutions. Today, the system of housing production becomes increasingly complex and mixed, the HDB partly commissioning private developers with the construction and sale of units that will afterwards be taken over and maintained by the public sector. The HDB started also to organize architectural competitions, and does not solely rely on internal planning services any more. These, in exchange, have by now been outsourced in a separate legal entity called *Surbana*, and provide consultancy and planning services not only to HDB but also to third parties across the globe. From an ecological perspective, the public background and environmental constraints of high-rise construction in Singapore have one major architectural consequence, specifically if compared to the tourist mecca Miami: focusing on the most cost-efficient way to house its own population, passive energy-saving solutions were preferred to technological ones, a trend that tends to be, at least partly, continued by the private sector. Buildings are hence conceived to maximize natural ventilation and to make air conditioning redundant. Until today, many owners prefer not to spend money on air conditioning. As a relevant detail, the air conditioning system is usually not centralized and the ac appliances are not included in the price of the condominium.

In terms of urban form, it would be mistaken to conclude that the city-state's high densities have led to a gradual extension of the relatively small historic core, offering mixed-use - often on the scale of the building - and being perimeter-block oriented. Today, the built environment is very diverse, and the result of high-rise compound and New Town developments that have over time intertwined in order to create a heterogeneous, but continuous fabric. It encircles protected green areas, reservoirs, army barracks and airports. Following modernist paradigms of highway planning, many of the residential "neighborhood units" - organized around loops or cul-de-sacs - do not entertain any direct relation to the major streets. In terms of spatial organization similar to European or US-American counterparts of the post-war era, higher densities and the connection to a very efficient public transport system help avoid the emergence of some of this development type's notorious problems, notably insecurity and social alienation.

The traffic issue, though existing, is not only tamed down through the efficiency of the excellent subway and bus system, but also through the state regulations regarding exorbitant import duties for cars.

ECONOMIC BACKGROUND / CULTURAL DIFFERENCES

Even more so than for the other categories of this paper, a brief paragraph leaves obviously not enough space for the comprehensive comparison of the cultural and economic features of two important urban entities. However, some fundamental points should be stated. If we start with the similarities, we firstly realize that both places are at least in the current social configuration of very young age. In the case of Singapore, this can be explained through the country's recent independence from Britain in 1963, and in the case of Miami through the city's late foundation in 1896, with a population of still less than 500.000 in 1950 (compared to the current 2,5 mio). Both entities are well known for their transient character, Miami as the « Gateway to the Americas » and Singapore as one of the major « transit points of the world ». Academics like Jan Nijman stress the thesis that the gateway position, tourist-orientation and embedding in a global network

of trade make it very difficult to establish strong social ties between the communities, eventually leading to a high fluctuation and a weak feeling of belonging. Over 51% of the current population has been born abroad. Interestingly, though difficult to measure let alone prove with quantitative tools, the mixture of young age, explosive growth and transit character seems to have in both places negatively impacted the creation of « collective memory ». Literature about Miami as well as Singapore hence frequently mentions the difficulty to safeguard and value the local heritage, most literally documented in the still too modest efforts of listing historic buildings.

A closer look at the economic key figures reveals a comparable size of gross domestic product, with 263 billion US\$ for the Miami metro area in 2011, and 277 billion US\$ for Singapore in 2012. To put these figures into the right perspective, we have to take into consideration that the Miami Metro Area covers over 6100 sq miles and Singapore only 274 sq miles. In terms of sector distribution, both export-oriented economies shared in 2011 with 16.3 and 17% respectively a similar share of wholesale and retail trade as part of the total GDP. Major differences can be found in the city-state's far more developed goods producing industry, including oil refineries (25% compared to 7.5%), and a considerably smaller real-estate sector. In the Miami Metro Area, it was in 2011 with 18.5% more than twice as large as the following item (wholesale trade with 8.2%). This last fact seems to be a historical constant, and explains the Floridian city's "boom and bust" reputation. A large percentage of the real estate investments is made by non-occupiers or secondary homeowners who will react more sensitively to changing market conditions than full-time residents. From this point of view it is interesting to note that both cities have a comparable amount of tourist arrivals (over 13 mio for Singapore in 2011 and 12.6 mio for the Miami region in 2010).

Singapore featured in 2010 with 56,000 US\$ the world's 3rd highest GDP per capita, Miami in the same year the 2nd lowest of the 25 most populous metro areas in the US (41.000 US\$). Of these regions, Miami-Dade County had with 0.503 also the 2nd worst Gini coefficient that measures income inequalities. Singapore had with 0.48 in 2012 a slightly better outcome, even though inequalities seemed to be overall on the rise. Education has become a regional pride for Singapore, not only through two universities ranked among Asia's top 20, with NUS (National University of Singapore) as number 2, but also through its school system which increasingly attracts pupils from neighboring countries. In 2012, the French business school INSEAD ranked Singapore as the world's 3rd most innovative country. Miami has in contrast a fairly bad reputation for its schools, particularly in the public system, and its highest ranked university, the University of Miami, does not surpass position 44 in the US, according to USNews.

These and other figures should not be summarized too quickly, but the direct comparison of Singapore's and Miami's development over the last decades leaves the impression that, today, both cities converge at each other, having started from an almost diagrammatically opposed position: if Singapore was since the arrival of the British forces in 1819 a central cross point of global trade, Miami is only since the 1980s developing into a "real economy" that does not solely depend on the leisure industry. Arguably, finance, real estate and international trade in conjunction with a remarkable population growth have created a critical mass that allows the Miami Metro

Region to grow into a more balanced, resilient and innovative economy and place. In Singapore, an almost opposite tendency can be perceived, supplementing and diversifying the stable base of trade and manufacturing with leisure activities and spectacular condo developments that hardly seem to fit the country's origin as a capitalist version of a planned economy.

POLICY ISSUES / PUBLIC CONTROL

Due to a lack of standardization, it is very complicated to compare the sustainability proficiency of two development systems, and such an exercise cannot be the aim of this paper. The comparison of building codes is complex, and so is the appreciation of the different labels and rating systems according to which the planning departments offer development incentives to ecologically motivated builders. Some systems put special emphasis on the use of biodegradable construction materials, and others on energy savings or urban connectivity. The interesting fact about Singapore is the existence of its own "Green Mark" rating system. Now in its third revision, it can more easily adapt to the specific conditions of a tropical climate than the LEED (Leadership in Energy & Environmental Design) system that is valid all over the US (and many other countries that have decided to abide by the same standards). The new Miami 21 Code, as adopted in 2012 for the City of Miami, requires buildings above 50.000 sq feet to be at least LEED Silver certified. Gold and Platinum constructions can in the densest zones, T5 and T6, benefit of enhanced floor-area-ratios. In Singapore, a very similar logic is applied. For several years after the introduction of the Green Mark Standards in 2005, the city-state even instigated a cash-fund, trying to accelerate the developers' commitment to advanced ecological design.

The biggest difference between the two cities, however, in terms of governance is the simple fact that Singapore is a city-state and Miami just a city in Florida. Miami's historic and chronic inability to develop or implement any major regional plan is also based on the subdivision of the metropolitan region, with appr. 5,5 mio inhabitants almost identical to Singapore's population, into three counties (Miami-Dade, Broward and Palm Beach) and a multitude of separately governed cities. Miami-Dade County alone with its 2,5 mio inhabitants counts 35 incorporated cities. The above-mentioned Miami 21 zoning plan is hence only valid for the 400.000 inhabitants of the most populous of these sub-structures, the City of Miami proper. Compared to Singapore's centralized one-party system, following a regularly updated masterplan since before its independence, Miami's political situation is almost caricatural, and specifically problematic regarding the implementation of new transport solutions. The question of development control is further brought to the head through the above-mentioned fact that 80% of Singapore's residential building activity lies in the hands of the HDB as government body. It is hence not only far easier for the city-state to "agree" on the definition of long-term development rules, but it directly implements the majority of these rules through its own construction activity.

NEW TRENDS AND GREEN FEATURES IN HIGH-RISE CONSTRUCTION

In order to provide an overview of the status quo and current trends for enhanced sustainability in high-rise construction, the following lines present three recent or ongoing projects for each location.

Miami

Brickell City Center

Scheduled to be completed in several stages between 2015 and 2018, this Arquitectonica-designed tower-on-base project covers four downtown blocks with a mixed-use program of 5.4 mio sq ft. From an architectural perspective, its major sustainability feature will be a « Climate Ribbon » that connects shopping and circulation areas on top of the megastructure's bases, including the skybridges between the blocks. The idea is to provide an outdoor shopping experience without air conditioning, protecting users from the rain and sun, but directing existing air movement in order to control climate comfort. The structure will also collect rainwater and potentially sunpower. Urbanistically, - though adapted to the American grid -, the project is reminiscent of some of the megastructures that have been built during the last twenty years along the reclaimed waterfront on Hong Kong Island. For Miami, it symbolizes the revival and further densification of the inner core through mixed uses. A special, and for Miami unusual feature is the provision of a direct connection to the people-mover transit system, currently still under-performing.

Le Parc at Brickell

This residential building, designed by Revuelta Architecture International and with only 12 stories exceptionally low for Downtown and Brickell standards, will provide 128 units, when finished in late 2014. Its marketing strategy - putting emphasis on 24/7 city living on the one hand and the existence of neighboring green spaces on the other - expresses particularly well the current tendency of the whole luxury market to present Miami as an urban paradise. LEED certification and the situation in a pedestrian-friendly district are considered to be sufficient in order to talk of « environmentally sound ». Pushing lifestyle-standardization to a particularly advanced level, the future owners will be able to purchase customized furniture packages by the French brand « Ligne Roset ».

Porsche Design Tower

This project by Sieger Suarez Architectural Partnership just started construction and is scheduled to be completed in 2016. A collaboration of the German design company and a local developer, the 60-story tall tower in Sunny Isles Beach will offer 132 units that can be accessed by car through three robotic elevators in the center of the building. In an extreme way representative of the top market's excesses, it also embodies some of the paradoxes of the Miami market. Situated in Sunny Isles Beach, a small incorporated entity on the narrow northern part of the Miami Beach Island, the tower can from an urban point of view not take profit of the as such intriguing idea to situate individual parking on the same level as the apartments. Theoretically freeing up space in the lower part of the building, frequently used for parking decks, its non-urban situation deceptively forbids any improvement of the relationship between the building and the street. On the one hand, "residents will experience interiors that are in harmony with the regional landscape and natural environment", on the other hand, they are now capable of avoiding any physical contact with their surroundings.

Singapore

Newton Suites

Opened in 2008 and designed by WOHA Architects, the 36-story tower with 180 apartments is an upscale private development in walking distance

to the inner-city core. Typical for the work of the architects, it uses passive design strategies as an inspiration for its expressive architectural form. Optimizing the botanical advantages of its tropical situation, the building provides planted walls, communal sky gardens and generous green balconies as if landscape was a construction material. It forms together with neighboring structures a high-rise cluster with - for European or American standards - a rather exceptional character as a chaotic mixture of suburbia, park and city centre. Partly elevated on massive pilotis, green surfaces represent 130% of the total site area.

Pinnacle@Duxton

As a result of Singapore's first international competition for public housing, won by ARC Studio Architecture+Urbanism, seven towering blocks with a total of 1848 apartments have been built between 2005 and 2010 by the HDB on a centrally located site in Tanjong Pagar. Two skybridges with playgrounds, gardens, a gym and a jogging track on the 26th and 50th floor provide the pedestrian link between the 50-storey tall elements. The spectacular setting and architecture is also reflected at the ground level with a carefully designed park and sloping surfaces. Unusual for public housing, the irregularity of the facade layout is based on the buyers' choice of bay windows, planter boxes or balconies. The exceptional development supercedes HDB's first housing slabs in this area from 1963 which were situated on the same site. Achieving a floor-area-ratio of over 9, the project's most pertinent sustainability argument is the combination of highest densities with an equally high living quality of public housing. The ongoing construction of 960 apartments in Skyville@Dawson, designed as a Green Mark Platinum megastructure by WOHA Architects, underlines HDB's efforts to further develop this high-density concept through the provision of communal skygardens.

Treelodge@Punggol

From the exterior comparably nondescript and remindful of older HDB mass housing projects, this compound - opened in 2011 - comprises several towers and is the first Green Mark Platinum development of the public sector. Situated in the New Town of Punggol in the north-eastern part of the island, it has explicitly been conceived as a showcase for sustainable construction that combines numerous passive design strategies with the newest energy-saving building technologies. Designed by the above-mentioned Surbana, previously an HDB-internal team, it features cross-ventilation, green roofs, a community garden, cool walls, solar panels, rainwater harvesting, light sensors, etc. Using to a high degree of precast technologies and recycled construction materials, the care for sustainability has also been applied to the construction process itself.

CONCLUSION

As a paper that tries not to solve, but to identify the right questions, interdependencies and relationships between the above-stated realms in view of a sustainability improvement of residential high-rise construction in the tropics, a conclusion can hardly be expected. However, as one of its main precepts, the paper actuates a combined analysis of formal- and non-formal parameters, trying to identify the most relevant interdependencies for the establishment of better practice in both places.

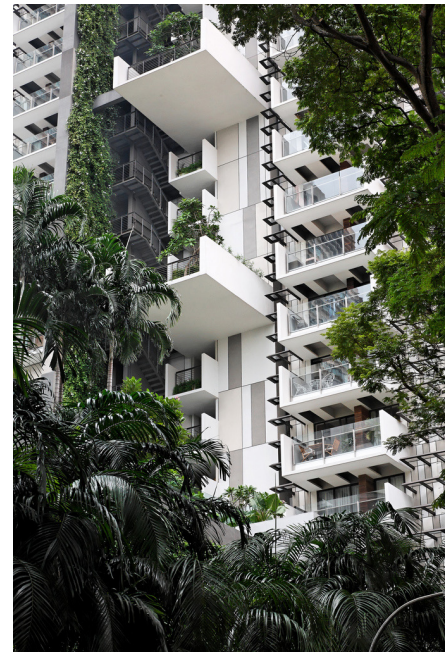


Figure 2: Newton Suites by WOHA Architects

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Figure 3: Miami Singapore table

The following table gives an overview of the study sectors, and positions the most relevant questions in its midst. Each of them can be understood as the outcome of a combined discussion of two topics. The author himself, or interested peers, will have to develop a priority-list of these questions, or use computation, in order to further advance knowledge in this field.

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