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The Evolution of the SkyPark Since the Marina Bay Sands

Jaron Lubin†

Principal Safdie Architects, 100 Properzi Way Somerville MA, USA

Abstract

This presentation traces the evolution of the SkyPark across multiple building types in different cities, climates and contexts from urban, architectural and social perspectives.

Keywords: Marina Bay Sands, Skybridges, Tall buildings, Public realm, Mega-scale



Figure 1. The Marina Bay Sands in the context of Singapore's Marina Bay. Image Courtesy of Marina Bay Sands.

1. Introduction

While bridging between tall buildings has been explored for many years, it was the Marina Bay Sands SkyPark in Singapore that elevated the approach to a 'typology'. The SkyPark became a prominent showcase for the public to see and experience what the profession already knew – that placing public activities in the air not only affords unique experiences, but also is a very achievable and sustainable means of densifying the city.

With the 'how' behind us, we can now evaluate this typology's impact, and explore how interconnecting buildings- aggregating a diversity of program, activities, and usages at high level- can and should influence the design of cities.

2. Why Bridge at All?

It is important to clarify our position and interests as to why we would bridge between buildings in the first place. We look at the tall building as a challenging typology as it relates to human scale, and since the founding of our

†Corresponding author: Jaron Lubin
Tel: +1-617-629-2100
E-mail: jlubin@safdiearchitects.com



Figure 2. Habitat '67 in Montreal, Canada.

architecture and urban design practice at Safdie Architects, we have sought alternative models to humanize it. In 1967, Moshe Safdie designed and built Habitat, an experimental housing project that aimed to re-think apartment living by fractalizing the volume of a single tower into smaller scale modules, stacking them one atop the other. By virtue of the aggregated volume organization, each residence benefits from a private roof terrace garden on top of its neighbor. The units are interconnected with layers of elevated outdoor pedestrian streets. The aim of Habitat is to introduce more space, light, air and individuality to the apartment building type, which is more and more frequently where so many humans are living.

In a 1988 editorial piece written for *The New York Times* entitled "Skyscrapers Shouldn't Look Down on Humanity." Moshe wrote:

> Eighty years is a very short period for the evolution of a brand new building type. It took hundreds of years for temples, cathedrals, palaces, towns and cities to evolve in the past. In that context we must recognize that the architecture of the tall building — its appropriate form and style — has yet to emerge. The past eighty years represent merely a flirtation with the issue; an innocent extension of the experience of thousands of years of low-rise buildings. That evolution would be advanced only by an architectural philosophy which has as its most fundamental concern the quality of life of those who inhabit the buildings and the cities in which those tall buildings are set.

Simply put, tall buildings rarely connect with us in the way that shorter ones do. Our work in this territory questions whether there may be another metric to assess a tall building's success: its contribution to the people who occupy and use them, and to the larger fabric of the city, aside from its exploration of style or its structural height.

3. Habitat of the Future

We have continued to research and develop our thinking on the tall tower typology, and the challenge of tower

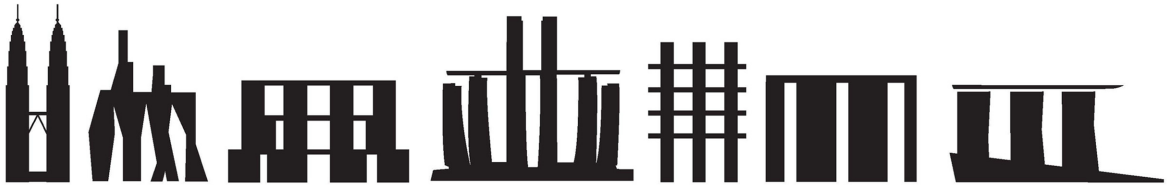


Figure 3. Re-thinking the tower block.

aggregation. Recent speculative and built works represent an ongoing obsession, so to speak, to evolve our relationship with the tower, which is both the largest and most common building block of the city.

At the outset of these projects, we test a series of questions related to a building's performance:

- How can we create residences that do not look into each other, or create undesirable shadows on one another?
- How can we avoid aggregations of buildings that create unfriendly, wall-like developments, or monstrous canyons as experienced from ground level?
- For office spaces with increasingly large footprints, how do we provide the benefit of access to daylight or to outward-looking vistas for all the workers?
- For mixed-use projects that include large shopping malls, how do we create spaces that are an extension of the existing street and also the public realm, rather than spaces that are introverted or privatized?
- What measures are available to allow for upper levels of buildings to be available for public use, rather than held separate for only the privileged few?

We often begin our explorations by fabricating volumetric maquettes out of foam, arranging scaled-down representational blocks to explore the appropriate relationship to the solar path, to the site, to surrounding structures, and to one another. We stack multiple storey blocks one atop the next and pull them apart from each other to create large-scale, multiple-level openings between them. The solutions we develop are more spatially diverse than a cluster of point towers - they are three-dimensional, porous organizations of structure. They invite communal activities at multiple levels, and offer the potential for mixed-use programming organized as much in section as in plan. These are spaces with multiple exposures and views, and with access to daylight and natural breezes for ventilation.

4. The Marina Bay Sands

In Singapore, The Marina Bay Sands Integrated Resort is the iconic centerpiece of the Marina Bay and Central Business District. The 598,700 m^2 development is more than a building - it is a city district. The program consists of a 121,000 m^2 convention center, two 1600 seat Broadway-style theatres, a 15,000 m^2 casino space, 74,500 m^2 of retail, an ArtScience Museum, and a 2600 key hotel.

The project is built on reclaimed land, set at a distance away from the existing central business district, and established in this location as a catalyst to extend and connect with the existing city development over the coming years. From the outset, our design strategy was to mass the building and set its arrangement with strong urban design principles, aligned closely with the master plan of Singapore's Urban Redevelopment Authority.

The hotel towers are by design, less tall than the available height limit on the site. They are divided into three 55 storey slab buildings, connected at their base by a continuous glazed atrium, accessible 24 hours a day to the public and connected directly to the public MRT system below. The 340 m long rooftop garden SkyPark bridges the three towers above and is the singular place that all



Figure 4. Habitat of the Future model explorations.



Figure 5. Marina Bay Sands Hotel atrium and Skypark. Photo by Timothy Hursley.

the people in the resort can gather with spectacular views of the city to the west and the ocean to the east. The 1.2 hectare (3 acre) park can accommodate up to 4,070 people. The aggregation of vertical and horizontal building blocks, the hotel towers and the SkyPark, create dramatic 'urban windows' that frame views from one side of the Bay to the other.

The towers are set back from the Marina Bay waterfront edge by several hundred meters, with a foreground development along the water's edge of smaller scale podium structures that engage directly with a continuous waterfront recreational promenade that rings the entirety of the Bay. The theatres, convention center spaces, and casino all link together in a series of interior retail streets, glazed with spanning skylights, insuring that all circulation spaces are day lit.

While access to the SkyPark swimming pool and gardens is available to hotel guests and those who dine at



Figure 6. Overview photo of the SkyPark. Photo by Timothy Hursley.

one of the restaurant venues, the space is considerably larger than a traditional rooftop bar or restaurant, and the experience is also very different. It offers a surreal experience by night, to oversee fireworks displays at Marina Bay, to enjoy a quiet place for a morning swim or to stroll through the gardens, elevated 57 storeys in the air. The SkyPark has become a destination attraction and has been embraced as a symbol of Singapore.

5. Raffles City Chongqing

In Chongqing, China, the Raffles City Chongqing follows a similar genesis story to Marina Bay Sands in that our team established a set of urban design, volumetric and spatial principles to break down the scale of the 817,000 m^2 mixed-use development. At ground level, the project base aligns a series of interior retail streets with the existing streets of the Chongqing city fabric adjacent. Connecting to the street level and forming the roof of the retail spaces is a 5 hectare public park that rises at a gentle slope, to a vantage point that overlooks the convergence of the Yangtze and Jialing Rivers. In Chongqing, we designed a crescent-shaped bridging structure that connects the towers, which we have called the Conservatory.

Our projects are derived from the uniqueness of their context, situation and program. While the SkyPark in Singapore was borne out of the desire to multiply outdoor landscape amenity spaces, the Conservatory is enclosed to protect visitors from the variable weather and air quality fluctuations of Chongqing. The Conservatory at the Raffles City Chongqing is an evolution of the SkyPark in that it also contains a greater diversity of building program, which knits the tower structures together both horizontally and vertically. The mixed use programming includes 1400 residences, a 450 key hotel, and indoor and outdoor public amenities. The Conservatory connects the peaks of four 49 storey towers together with the mid-points of two supertall towers rising to 74 storeys above ground level. It is organized with a central spine of circulation that links across four cores. Each lift core contains local and express lift systems that interconnect residents and guests speedily to the horizontal Conservatory deck level.

The 280 m long glass and steel Conservatory also contains the hotel lobby and its amenities, including restaurants, a spa, swimming pool and other facilities, with the hotel rooms rising in the tower above. More than an open space park, it is envisioned as a horizontal tower. But unlike a tower, where views on the top are reserved for expensive office spaces, hotel suites and luxury condos, the Conservatory provides all the residents and visitors the same experience, available 24 hours a day. The structure allows the space to also be re-programmed time and again, over the course of its existence. The project will open in late 2019.

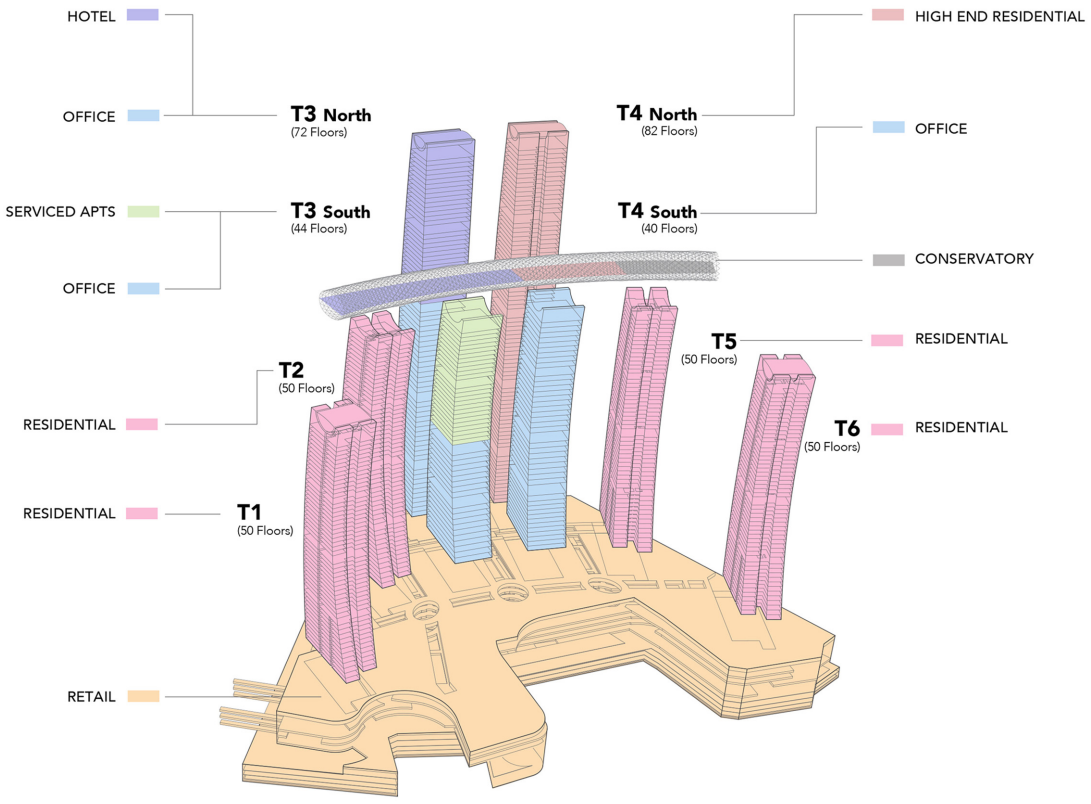


Figure 7. Diagram of the Raffles City Chongqing Massing.



Figure 8. Photo of the RCCQ Conservatory Under Construction January 2019.

6. SkyHabitat and Holland Village Singapore

Two further projects, both in Singapore, explore the potential of networking building structures at multiple levels in the sky: Sky Habitat, a private condominium complex, and Holland Village, a competition entry. These high-rise residential projects demonstrate that high density urban areas do not negate the possibility to create highly livable, quality pieces in the city.

Looking beyond the common point tower-on-podium typology or bar building typology, the team explored design options that were more spatially connected vertically and horizontally. As in the original Habitat project of 1967, the building circulation is organized as outdoor pedestrian 'streets' located at each floor level. The openness of the buildings allows for natural air circulation and cross-ventilation, reducing the reliance on air conditioning systems and minimizing annual energy consumption.

In Singapore, there is a tradition of providing generous outdoor communal facilities, a tradition of community living that originates with the HDB public housing. An example of this 'social infrastructure' at Sky Habitat is the provision of three garden bridges that interconnect the two towers. The bridges support communal gardens, outdoor dining spaces, places for recreation and even swimming pools. Particularly at night, the residents spill out to all the outdoor garden spaces at many levels in the building to enjoy the bridges that are available at height, to have their meals and to spend quality time with their families and friends.



Figure 9. Photo of Sky Habitat.



Figure 10. Holland Village Singapore Proposal.

Perhaps the strongest visual feature of the buildings is the stepped silhouette form. The outer edges recall the language of Habitat, with over one-third of the units featuring outdoor terrace gardens that are extensions of the interior living spaces. Allowances built into the state regulatory systems in Singapore allow open-to-sky terrace spaces to be exempted from GFA, a promotion that matches architectural design intent to developer incentive. The large terraces are more like outdoor rooms, fully furnishable spaces with planters large enough to fit a tree.

For our proposal at Holland Village, rather than creating dedicated bridges between towers, we opted to bridge the tower blocks themselves. The proposal staggers the tower form every 6 storeys, creating large multi-storey atrium spaces at multiple levels and featuring communal gardens. Interconnecting the towers once again increases the shared space for the residents, reinforcing the concept of a vertical neighborhood.

Landscape designs at all levels feature a variety of planting types and create a great diversity of experience recreational, quiet and meditative. Multiplying the garden spaces at many levels allows us to recover more green space on the site than was originally in place at the outset of the design brief.

7. Towards a New Typology

For a recent high density mixed-use development proposal in Toronto approaching an FAR of 18, we have proposed what might be our most ambitious scheme to date. Our design utilizes a catalogue of building blocks: compact vertical tower blocks, stepped slab bar blocks, and occupied bridges with gardens, to create a three-dimensional sixty storey network across a large urban site. The base of the building is programmed with several levels of retail and tied directly to public transit systems. A first 'layer' of office block slabs are stacked above the retail and linked together by sky bridges interconnecting the blocks from one side of the site to the other. Above the bridges, we positioned a series of residential blocks, some designed as vertical 'points' and others organized as stepped bars, all reaching to a summit of an additional sky bridge connecting between the structures.

The result is a prototype for a three-dimensional city,



Figure 11. Sky Habitat Bridges.

extending from ground level to the sky. The scheme can be organized, programmed and populated with many variations. Larger floor plates extend through the bridges and into the bar building slabs. Smaller footprints within vertical connecting tower elements support flats and through residential units with spectacular corner view arrangements. The spaces between and atop bridges hold amenities and gardens. The structural depths of the bridges themselves can be programmed as circulation and also as inhabited spaces with spectacular vantage points of the city. Given the Toronto weather, we also developed details for the architecture to be 'convertible', with large glass operable walls that can open the spaces to the outdoors, and all-season glazed solaria that can be opened up during the warmer months.

We remain excited about the potential of what we have designed, and we speculate on its further evolution. Imagine an integrated network of vertical and horizontal circulation above street level, with transparent wind and fall protection barriers, with overlooks and observation areas, with expansive gathering spaces at height featuring a variety of hardscape surfaces and a diversity of urban planting, of common elements that are symbolic of a particular city place like street signs, site furnishings, pole lighting (and refuse bins)? The next consideration could be multiple architects working together on these projects in a multi-tower, bridge-block neighborhood, to give each building block its own identity, while the sky streets form a type of order, commonality and connectivity, not dissimilar from the language of the city grid below.

And of course there will be future conditions where

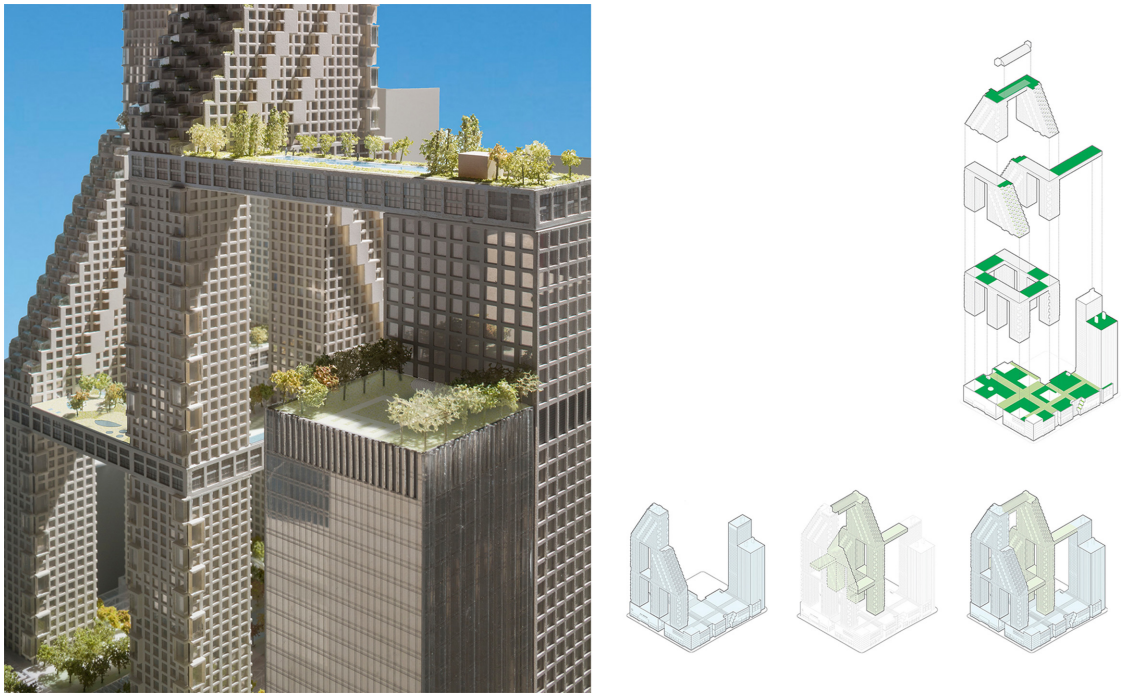


Figure 12. Study Models for Toronto Mixed Use. Image courtesy of Safdie Architects.

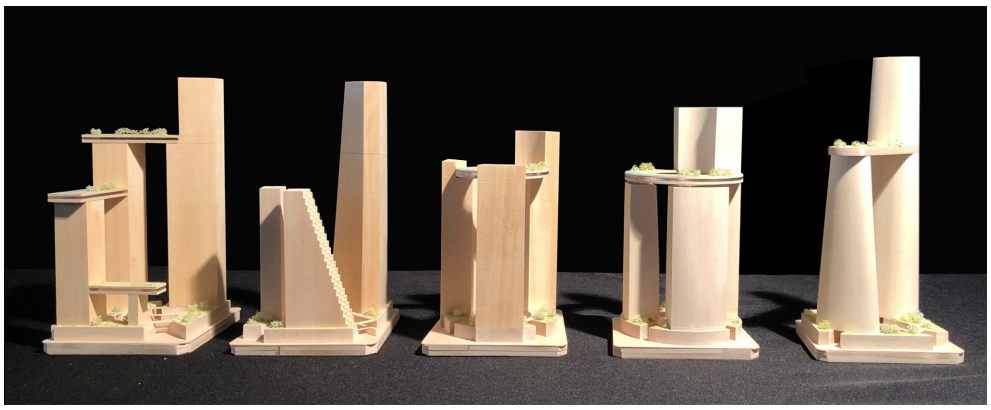


Figure 13. Towards a New Typology.

existing and newly designed structures can be bridged and interconnected. Would these networks 'emerge,' as is the case in the interconnected malls in the central area of Hong Kong, or should we alternatively conceive with local authorities a set of guidelines for three-dimensional volumetric zoning and structural works, prioritizing daylight penetration and limiting shadows to the lower levels? Certainly, as tall towers remain the largest building blocks for the city, and as our urban centers continue to grow increasingly more dense, it is important for the health of these places and everyone who lives and visits them, that we continue to examine the typology as well as to study tall buildings' interrelationship one to another and to the surrounding urban context.

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