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Author: Moshe Safdie, Principal, Safdie Architects

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The Garden City in Three Dimensions

Moshe Safdie

Interviewee

Moshie Safdie, Principal
Safdie Architects
100 Properzi Way
Somerville, MA 02143
USA
t: +1 617 629 2100
f: +1 617 629 2406
e: boston@safdiearchitects.com
safdiearchitects.com

Moshe Safdie is an architect, urban planner, educator, theorist, and author. Over a celebrated 50-year career, Safdie has explored the essential principles of socially responsible design with a distinct visual language. A citizen of Israel, Canada and the United States, Moshe Safdie graduated from McGill University. After apprenticing with Louis I. Kahn in Philadelphia, Safdie returned to Montréal to oversee the master plan for the 1967 World Exhibition. In 1964 he established his own firm to realize Habitat '67, an adaptation of his undergraduate thesis and a turning point in modern architecture.

Author of four books and a frequent essayist and lecturer, Safdie's global practice includes projects in North and South America, the Middle East, the developing world and throughout Asia and Australia. Projects span a wide range of typologies, including airports, museums, performing arts, libraries, housing, mixed use and entire cities.

With a career spanning back to the Habitat '67 residential complex in Montréal, Moshe Safdie's work has always evoked images of utopian science fiction, yet is grounded in sound, time-tested principles. He has a unique perspective to offer on the World Congress theme of "50 Forward | 50 Back." At 81, Safdie is showing no signs of stopping. The spectacular three-towered, "sky-pool"-bridged Marina Bay Sands project in Singapore will see a fourth tower added, with its own rooftop landscape.
The massive eight-towered Raffles City Chongqing is nearly complete, and may soon claim the title of both highest and longest skybridge in the world. The recently opened Singapore Changi Airport "Jewel" features the world's highest indoor waterfall. CTBUH Editor Daniel Safarik capitalized on a rare pause in Safdie's schedule for an illuminating conversation.

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Moshe Safdie will deliver a closing plenary address in the session "50 Forward: Urbanism for the Future," Wednesday, 30 October.

> **In 1967, the marketplace did not feel Habitat was reproducible. Now we have come full circle, and people are appreciating the principles behind it, and applying it within their own work.**

I'm interested is the progression of the idea of the three-dimensional city, that has gone through your entire body of work, and seems to be where you're headed as well. There has always been a strong sense of the human scale in your projects, even as they have become larger. What are some of the devices that you have used that relate the scale of human occupancy to the large gestures that the projects are also making?
In terms of scale, let's move from the domestic residential environment to the mixed-use city. In the case of purely residential projects, beginning with Habitat (see Figure 1), the key is the hierarchy of elements that make up a community. There are individuals and families, which translates into residences or houses. Then there are community groups, which have various scales of being. You have a bunch of people who live around a courtyard, you can call that "neighborliness." Then, there is a larger group of people who share schools, shopping and so on; it sort of builds up to form the entire city.

Architecture has to echo and reflect that, and it has to strive to maintain the legibility of this hierarchy. We are reasonably comfortable with a small village: it's all there; it's legible. The individual houses can be read in the fabric; they have their own identity, courtyards and

various other devices define the next cluster, but when we stack it all vertically and multiply it to 50 times the density, it just takes more consciousnesses and more complexity to achieve the same ends.

So, beginning with Habitat one can see the cluster; you read the overall building in the fabric. But the original Habitat that never got built, which was proposed to the government, went further as a three-dimensional city, inasmuch as it contained the community facilities, the schools, the shops and all that. It was conceived as a mixed-use building that could contain residences, hotels or office space; and it had actually gone much further in showing how you achieve, not just a pure domestic environment, but a more mixed-use one.

For the larger Asian projects, in the same sense you fractalize surfaces where you want to make a lot of outdoor green spaces, and you break it down into legible parts as it gets larger and larger. You articulate the circulation in a way that you can read and understand its presence, both from outside and within the structures. I think seeing and understanding the circulation physically in the urban scale is yet another device to tell you where the entrances are, where movement is, unlike

when it is sitting in the depths of the building and you have no clue what is going on. Most high-rise development is problematic because it doesn't reveal all of these things. The dominant developer strategy goes for compactness as a form of economy.

The articulation of comprehensible, house-sized units is very clear in projects such as Habitat and Sky Habitat in Singapore. How does the response differ when you have a program like the commercial mini-cities of Marina Bay Sands or Raffles City?

Marina Bay Sands focuses on the top and ground. Hotels present a very different problem, but even there, I was charged with designing a single tower for 3,000 rooms. That was the original program. It would never have been a supertall (300 meters or higher) because there was a height limit. It would have been a large slab in the style of Las Vegas hotels. It would have formed a wall between downtown and the waterfront, and because I couldn't go 100 stories high, I would have to have spread into a long slab. I thought, the visibility of the harbor and downtown can't be lost. I broke it up into three, and made the big urban windows in between them open to the city. I broke it down even further, by pulling out the sidewall planes of the towers, so you read it as six buildings, via the layering that makes up the hotel rooms in each tower.

Then of course, there was a question of, in all that concentration, can you create some real leisure/recreation space? That gave birth to the SkyPark. All the roofs of the podium are part of the public realm. Even the mall in Marina Bay, which had initially been conceived as internalized, we pulled out and made it part of the promenade, so it's partially indoor and partially outdoor, and it's completely in the public realm. There, the focus is on how to make such a dense environment a true public realm, that's accessible to everybody and connects to the network of the city.

In Raffles City, we didn't go far enough in terms of the concept. There isn't enough distinction between the residential and the office and the hotel. Something we hoped to take further were the mixed uses; we might have been able to put some of the workspaces and some of the office spaces in lower levels, and then separate them via horizontal promenades and streets. The next layer might be residential, with some vertical stacking that might be legible outside the project.

Do you feel that this model, derived from the original Habitat, is replicable across all kinds of markets and all kinds of governments, and societies?

I think it is important, on one hand, to recognize regional differences. Doing this in a cold city like Montréal, as opposed to a

tropical or sub-tropical climate, and depending on culture and economy, would tend to create variations. You couldn't build Habitat as I designed it in Saudi Arabia, simply because of the cultural requirement for privacy. Terraces to be enjoyed by the family can't be viewed by others, so there would be variations in the details. But in principle, the indoor and the outdoor space, the legibility, the identity, all apply. There are just variations in texture and in detail.

These principles were misunderstood after Habitat '67. People always wanted to decide if it was broad social housing or luxury housing, which was beside the point. Maybe because of the economic depression at the time, the marketplace did not feel that it was reproducible. Now we have come full circle, and people are appreciating the principles behind it, and applying it within their own work. Expectedly, you get strong visual connections, because the same principles yield the same textual urban fabric, so a whole bunch of people are acknowledging it now as the source of inspiration. That's sort of a nice thing to be experiencing.

What do you think about utopian high-rise projects in general? It seems their fates have been mixed.

Some utopian projects of the 1950s and 1960s never got built, so they remain a mystery.

Figure 1. Habitat 67, Montréal.
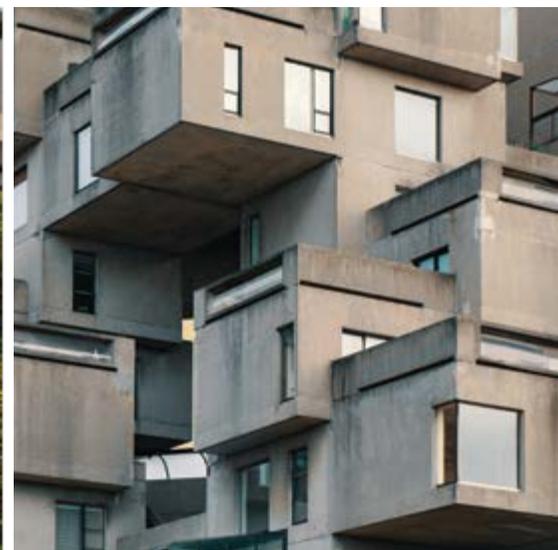
Figure 2. Marina Bay Sands, Singapore. © Hu Chen (cc by-sa)

But of those that got built, some proved to be desirable, popular successes. Others really became white elephants, because they proved to be not what people wanted, and that is important to distinguish.

For many years L'Unité d'Habitation (Marseilles, France) was very much a shunned address in terms of desirability, and I can say that even more vigorously about some of the projects that were built as a part of the housing projects of France and Britain. So, the thing about Habitat that I think distinguishes it from many others was the fact that nobody argued about the desirability of the environment. They argued about affordability, but the possibility of this becoming a commonplace solution, whether it was a desirable place to live, was never an issue—it was a resounding "yes" from the public at large.

With your large-scale projects such as Mariana Bay Sands and Raffles City, the horizontal aspect is as significant as the vertical. How did you convince the clients to go with a skybridge or skyplane connecting multiple towers?
Every step required a great deal of convincing. One of the things that helped the project was that some of these concepts resonated with the urban design requirements that were in the RFP from the government of Singapore. That helped us sell the outdoor space, green

recovery and some of the view corridors that I have spoken about. However, the requirements didn't mention the view corridor of the ocean (see Figure 2). That was something that came from us. It is the nature of the developer community, including this particular client, which has its way of doing things. This is demonstrated by all of their competitors' hotels in Las Vegas: There is a very large, singular building for the hotels; it's not about the public realm, because you create an internalized private realm in Vegas. This was a turning upside-down of everything in the rule book of "Vegas"-style resorts.

And now Singapore is unimaginable without it. How did the process go in Chongqing?
It's interesting, because the Chongqing municipality identified the site as being very pivotal for the city's image and future. They had a competition preceding our involvement. I think there were eight schemes, and the city leadership did not feel any of them rose to the occasion. CapitaLand were aware of that, and they approached the city and said, "Will you let us make a submission with our own architect?"

There was a second competition round, in which we broke two of the rules. The diagram that the city published showed the road system cutting through the site, and it also showed the singular mega-tower on the

central axis, with some lower ones flanking it. I felt that with this kind of density, mid-rise buildings around a singular, massive tower was not what the site needs. It needed to create a very powerful public realm, and somehow through this development, there was a need to connect the city streets south of our site with a plaza that existed already to the north.

I created a pair of towers on the axis, emphasizing the gateway nature of the site and left the visual access open in between them (see Figure 3). That's something I learned from Columbus Center, my unbuilt project in New York, in which I left the axis of 59th Street open and put two towers on that axis, in order not to block the 59th Street view corridor.

The other big thing was to then have a number of towers and connect them with an enclosed skybridge, which we call a "conservatory." It did not make sense to do an open skypark, due to the hot but often cloudy climate of Chongqing and the amount of pollution. Then, I rerouted the traffic on both sides of the site, so that pedestrianized streets pass through the project, through enclosed malls but in alignment with the city streets. So, they go from the city streets and end up on the plaza. It's like the Galleria Vittorio Emanuele II in Milan that starts at the Piazza della Scala and ends at the Piazza del Duomo.

Both ends of it are important public destinations, as at Chongqing.

You're one of the few architects operating at this scale and actually pulling it off, where you've got a 3D city that actually functions horizontally and vertically on several planes. Have you given thought to what the next generation of these buildings would look like, in a world of flying cars, drones, horizontal elevators, and the like?

It's really on my mind, because we are involved in a couple of projects where we are going to do a scale jump even beyond Chongqing, and one of the questions becomes, how are you moving within the project? There's all kinds of vertical circulation, and some of it by nature is private. Going up to the skypark in order to transfer to a residential lobby is one condition, versus if you've got a conservatory or a skypark connecting half a dozen buildings.

People want more open space, and that might be satisfied by having an elevator system that is truly public and independent of the buildings on which it rests. It would need to address all the security issues from the people coming off it, involving a lobby which is controlled like any lobby, and that's a fascinating next step.

I've seen discussion about drones, although I have yet to feel that I will see [ubiquitous drone use] in my lifetime. Are we going to break the barrier of vertical elevators and start doing an elevator system that is more

innovative, like one that can change direction, run on an incline, or which can lend itself to other forms of massing? I hope so. Right now we are kind of inhibited. For the original Habitat, I designed elevators 60 years ago that would have done this. Today, I'm still not sure if they can make them economically for a project.

Thinking again towards the future, there are questions about the carbon footprint and the sustainability of concrete. Many of your projects have been rendered beautifully in concrete. Have you seen other materials beyond conventional concrete and steel that you would like to see used?

For years I've been reading these articles about "miracle concrete" arriving around the corner, and it never happened. I experimented with chemically stressed concrete that expands when it sets, and stretches the reinforcing in it, but it has its own issues. My friend Neri Oxman has been working at MIT Media Lab, on materials that are organic in their behavior, but so far, we have only applied this to domestic-sized structures, not for building large buildings in the city.

Fireproofing is the governing property, so if you are dealing with low density, there are a variety of materials in the plastic realm that are possibly realistic, but as soon as you go into high-rise, unless there is a certain level of fireproofing, it's just too vulnerable. There is of yet no breakthrough; nor have we figured out how we can encase steel other than spraying fireproofing on it and enclosing it in concrete.

Would you consider working in mass timber?

I have and I am. I think mass timber is okay for 10 to 20 floors, but I think it exhausts itself beyond that. It's a structurally limited material, and above 20 floors, it just doesn't meet the minimal safety standards.

It's difficult enough to get local codes modified to accommodate what is technically feasible.

Right, I'm working on a 20-story hotel in Maine right now, and we started with wanting to do the whole tower in structural wood, but when it really got down to it, we would have paid such a premium by the time we worked out all the issues, that the developer was reluctant to do it.

What are you most excited about in the tall building realm?

We have two or three interesting projects right now. One is in Seoul, and one is in Shenzhen. We have a very interesting client for the Seoul project; they are the largest food processing company in South Korea, and the project includes several levels of manufacturing underground, as well as a cluster of mixed-use towers with horizontal sky parks. I think it's very exciting if it proves feasible, to build a logistics and manufacturing hub. And because they are food producers, we have also demonstrated our ability to host some agriculture on the skyparks.

You've inspired multiple generations of architects to go forward with designing high-concept but ultimately very practical, humanistic high-density environments. Is there anybody in this current generation of architects that has you feeling hopeful or that you think is promising?

When I think of the next generation, I think of firms like Bjarke Ingels Group (BIG), MRVDV, OMA and some of the graduates of OMA, like Ole Scheeren. Particularly on the residential side, and with horizontal connectivity, I've seen recently some projects and some proposals that seemed to be picking up on some of these concepts. It feels good to invent things or be pioneering, but it feels even better to see that they have taken root. ∎

Figure 3. Raffles City Chongqing concept render (left) and under-construction (right). © Capitaland Limited