School of Environment Department of Architecture, Griffith University, Gold Coast, Australia Cecilia Bischeri /

Silvia Micheli

School of Architecture, The University of Queensland, Brisbane, Australia 7

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New Directions for the Dense City: Moshe Safdie in Singapore



The city-state of Singapore declared its independence in 1965, launching an intensive process of modernisation with the aim of erasing any evidence of its colonial past. The developmentalist orientation of Singapore (Beng-Huat, 1991, p.27), captured in the formula "displace, destroy, replace" coined by the Japanese architect Fumihiko Maki and turned into an ideological motto by the political leader Lee Kuan Yew, led to the definition of a precise urban vision for the future of the city (Koolhaas, 1995, p. 1035). Due to its political agenda, population growth and limited area of construction, Singapore has become a contemporary urban and architectural laboratory of the Asia Pacific Region and epicentre of experimentation for the densification of dwelling. Even more, Singapore is now recognised as the place where modern utopian principles forged in Europe during early 20th century, and advanced in the 1960s and 1970s, are taking place, generating new forms of living. One of the significant protagonists of this experimentation is the Israeli/Canadian architect Moshe Safdie, whose recent design for the integrated resort casino Marina Bay Sands (2006-11), has become an international showcase of Singapore's drive for innovation.

Moshe Safdie (Haifa, 1938), moved to Canada in 1953 and graduated from McGill University in Montreal (Quebec) in 1961 with a degree in architecture. After gaining visibility with his Habitat'67 housing megastructure, he opened his practice and started working internationally, with consultancies and projects in Jerusalem, Senegal, Iran, Singapore and Canada. In 1976 the publication of the book Habitat Bill of Rights, written by Safdie in collaboration with Nadar Ardalan, George Candilis, Balkrishna Doshi and Jose Luis Sert, proved a pioneering document for the investigation of qualitative affordable housing, marking a shift in Safdie's practice. Safdie served as Director of the Urban Design Program at Harvard University Graduate School of Design (1978-84) and Ian Woodner Professor of Architecture and Urban Design (1984-89). Amongst his many international honours, he was recipient of the 2015 AIA Gold Medal, awarded "in recognition of a significant body of work of lasting influence on the theory and practice of architecture" (AIA, 2015).

Much earlier than his involvement in the construction of "the new Singapore," his theoretical and design work addressed dense dwelling and urban living, beginning with his residential project Habitat'67. Conceived as a prototypical residential component for the future city at the 1967 Expo in Montreal (Canada), Habitat'67 immediately became Safdie's social utopian manifesto (Fig. 1). With a different social premise, Safdie's last residential development in Singapore, Sky Habitat (2015), is a gated community that targets an upper-class market (Fig. 2). Distant in time and social ideals, these two residential projects display comparable strategies, as the use of similar architectural solutions and the permanence of modern urban utopian principles in structuring the building. What was an experimental prototype, elaborated in the '60s in the international context of an Expo in Canada, has become a "realised Frontispiece (Fig. 1) Moshe Safdie (1967). Habitat'67, View from entrance [Courtesy: Moshe Safdie Architects, Boston. Photo by Jerry Spearman].



Fig 2. Moshe Safdie (2016). Sky Habitat, View [Courtesy: Moshe Safdie Architects, Boston. Photo by Edward Hendricks].

utopia" in one of the most rampant and connected megalopolis of Southeast Asia. Safdie's set of works provides opportunity to reflect on how utopian ideas conceived in Western culture have become a design possibility in Asian's developing countries, increasingly affected by population growth concentrated in urban environments.

Hotbed for new utopias

"Density" appears to be one of the most pressing factors in contemporary cities. On the one hand, uncontrolled density leads to dehumanising living conditions – density being recognised as a chronic illness to keep under surveillance. On the other hand, the state of having a highly concentrated built environment, population and presence of services is the most intrinsic and vital condition of "being a city." Therefore density, and its consequential "congestion," is a fundamental aspect of the city – fuel for its urban engine (Koolhaas, 1978). Suspended between these two opposite interpretations, density has become a driving component, a theoretical instrument to develop new urban forms and promote new social behaviours.

In 1933, the Charter of Athens established new guidelines for the design of the city and the theorisation of modern urban utopias based on the ideal achievement of better human conditions. For the first time, these theories critically engaged with the city, proposing alternative strategies based on a more incisive approach to density and its four functions - habiter, travailler, se récréer, circuler [live, work, leisure, mobility] - surpassing the bucolic and anachronistic solutions previously envisaged. The Corbusian Ville Radieuse can be considered one of the exemplary urban design outcomes of Charter of Athens and his Unité d'Habitation in Marseilles its avatar. The International Congresses of Modern Architecture (CIAM) in Otterlo in 1959 had a great impact on reviving the core criteria of the modern utopias. The four Corbusian urban concepts were taken as points of departure with the intent of updating and translating those pillars of the modern utopian city into reality (Nicoletti, 1971). The general positive atmosphere promoted by the Otterlo congress sparked a period of intense theoretical elaboration around the topic of the future development of the city. Since the Charter of Athens, the leading protagonists of international architectural discourse widely experimented and theorised on how to improve living conditions in the city. Although new waves of urban theories prompted a process of critical revision of the initial modern utopias, their ideological premises remained the core of the debate, still innervating the urban international agenda of the '50s and '60s. This was the architectural context in which Safdie's education and training took place.

Safdie's thesis developed at the McGill school of Architecture was discussed in 1961. Officially titled "A Case for City Living," it proposed a three-dimensional modular building system for a community of 5000 people, which contains all of the concepts that would be realised in Habitat'67 (Fig. 3). It tackles the problem of how high-density urban housing can be combined with the amenities of low-density suburban housing developments ("The Moshe Safdie Archive", 2016), reconciling two apparently incompatible realities: inner-city living and suburbia. The years at McGill were fundamental in shaping the design ideas that informed Safdie's future design production. The Dutch-Canadian architect and urban planner Sandy van Ginkel, who participated in the Otterlo CIAM and lectured at McGill while working in partnership with Aldo van Eyck, played a pivotal role in the development of Safdie thesis and theoretical directions (Dillon, 2013, p. 116).





Other fundamental figures who influenced Safdie's education while devising his thesis, were Richard Buckminster Fuller and the Japanese Metabolists, focussed on a range of new architectural responses for radically addressing the urgent needs of rapidly developing cities.

In Japan in 1970, I visited the offices of several of the 'Metabolist' architects. I went there with the conviction that they were in the forefront of thinking about the tri-dimensional city [...] The question I asked the Japanese had to do with problems such as 'What kind of structure could possibly hold their building up,' or 'How could someone move around inside of them,' or 'What materials would be used?' Often the response was that this had not yet been considered. (Safdie, 1974, p. 2)

Safdie's research on three-dimensional residential constructive systems and his Habitat'67 were embedded in the international utopian discourse of the 1960s, which represented the first wave of a revisionist counter to orthodox modernism (Safdie, 2002, p. 234). For instance, the relentless repetition of building types proposed in the urban grids of Le Corbusier and Hilberseimer was redeemed by a more humanising approach, according to which individual and families regained their subjective dimension. This attention was evident in Safdie's urban schemes, as they brought together the experience of the early modernist urban models with the vernacular dimension of the Mediterranean village. A similar sensibility underpinned the critique of modernism set out in Aldo van Eyck's playgrounds, Candilis' projects in North Africa, Giancarlo De Carlo's delicate interventions in Italian historic towns and Kenzo Tange's floating urban spine for the Bay of Tokyo. Beyond their geographical, dimensional and functional differences, they all focused on the idea of community and its identity, considering the individual and not just the mass. In so doing, they were rejecting Camillo Sitte's urban sentimentalism as well as functional rationalism (Frampton, 1992), recovering instead the value of the street, courtyard, garden and district.

Through different degrees of criticism towards the existing conditions of the city, their proposed projections avoided the alienating results of modern utopias. "Clustered", "diverse," "compact" and "walkable:" these were the alternative fundamental attributes for urban developments, and "density" was understood as a key potential. Prefabrication was deemed as one of the most promising fields of experimentation for dwelling, able to combine demand for density with economically affordable solutions and a reduced construction period. Mass production and industrialisation reached a level of efficiency unimaginable before facilitating the general state of enthusiasm and confidence in its deployment at larger scale. In this ideologically fecund and fervent period, Safdie conceived his scheme for Habitat'67.

Habitat'67: A manifesto for the supercommunity

The topic of Expo 67 in Montreal (Canada) was "Man and his World," directly drawn from Antoine de Saint-Exupéry's book *Terre des Hommes* (1939). Hopes for a future where solidarity and a communal spirit would have fostered an improved human condition constituted the general feeling substantiating the book, which mirrored the positivist atmosphere leading the Expo. The involvement of Safdie in the international event was initiated by Sandy van Ginkel, who was appointed by the city council to develop the master plan for the exhibition. Van Ginkel chose Safdie to be his chief designer, whose acceptance of the position was conditional to the possibility of building a revised version of his thesis project (Habitat'67) as one the World Fair's pavilions (Dillon, 2013, p. 117).

Habitat'67 (1963-67) is a community of 158 apartments with multiple exposures, a hybrid between single-family houses and a highrise apartment building (Safdie, 1997, p. XI). The building is a linear residential structure that runs along the shore of the St. Lawrence River. This cluster of houses and streets piled up in the air encompasses different aspects of Safdie's positive urban ambitions, becoming a tangible manifesto of his experimentation with density and criticism of suburbia - the latter regarded as an unsustainable model. Taking into account the urban population growth of contemporary megacities and the accelerating land consumption, Habitat'67 had about 10 times the density of an average suburbia block (Safdie, 1967a). The architect's principal aim was to generate a dense urban device in the inner-city, able to host a considerable number of people, while providing a high level of personalisation and comfort, a significant feeling of privacy and provision of contained garden spaces. Each module is formally distinct, enhancing the value of individuality versus homogeneity that characterised previous large dwelling schemes. Striving for the utopian idea to recreate a village atmosphere, apartments became houses, corridors were turned into streets and balconies into private gardens. The motto "for everyone a garden," and its actual provision, became a paradigm of a particular conception for the habitat of the future, where accommodation had to bring together density and lifestyle with high level of comfort:

The very first Habitat proposal was to build a supercommunity, that is, a community at superscale. The complex would contain all the institutions of a city: schools, shopping, clinics, galleries, theatres [...] It would have been a situation analogous to that of the real city [...] At the end of Expo, a living community would have remained – one that we could have continued to learn from and enjoy. (Safdie, 1974, p. 6)

The second objective of Safdie's utopia was to design a "system," a concrete structure that could be extendible and replicable. In this regard, the Habitat'67 scheme, which was initially conceived out of a physical model in Lego® blocks, had to be economically sustainable: that is why a pre-cast three-dimensional modules technology was chosen. Therefore, the realisation of the project was of paramount importance for Safdie, in a time characterised by the richness of visionary images but shortage of built projects:

And that I think is the most radical thing about Habitat — that we managed to realise some really interesting ideas in built form. We made a quantum leap by actually building it, with real construction techniques and real materials and structures. Suddenly Archigram and all the others seemed terribly naive, dreaming up images but not buildings. And then Kurokawa managed to build his own tower — that funny thing with plug-in pods. (Safdie, 2013, p. 120)

The idea of mobility underpinned Safdie's intention of conceiving a continuous structure at the urban and even regional scale. In 1970, just after the Montreal Expo experience and in preparation of Expo '70 in Osaka (remembered as the "Metabolist Expo"), Safdie wrote:

Mobility is the central and most critical question, with the greatest influence on the form of cities [...] There must be a whole hierarchy of systems – the speed of an elevator, the speed of a pedestrian, the speed of a car, all the way to five hundred miles an hour, and all synchronised to exchange passenger in motion [...] This idea of continuous systems in motion [...] could create a linear system with loops generating out of it, like a necklace. (Safdie, 1970, pp. 227-228)

In Habitat a similar emphasis was posed on circulation. The term "street" was abundantly used to simply refer to pedestrian connectors in describing the internal circulation of the building (Safdie, 1967, pp. 16-20).

Straight after the opening of the building, Safdie moved in with his family. Habitat'67 became a thematic pavilion attended by thousands of visitors assuring to Safdie worldwide recognition and access to the urban avant-gardist milieu. It was heralded as a revolutionary concept, "the complex that revolutionised urban housing design" able to embody the urban, social and technological utopias in a fragment of Montreal urban texture. The impact was certainly very potent considering both the prestigious showcase and the attention that these themes were generating at the time. Soon after Expo '67, "Habitat Puerto Rico" and "Habitat Jerusalem" followed, being Safdie asked to export his prototype and adapt it to different urban and social contexts (Safdie, 1989, p. 25).

Density, industrialisation, technological aspects and a sensibility for sociological aspects appeared to be the common denominators for several residential projects with a similar scheme to Habitat'67 popping up around the world. The relevance of those residential projects lays in the fact that those buildings constituted, at the time, the only built forms of alternative ideas envisioning the future-city to be.

The Kafka Castle by Ricardo Bofill in Barcelona was completed in 1968, aiming for the promotion of a progressive and innovative multidisciplinary approach. A team of architects, engineers, sociologists, and philosophers collaborated to provide architectural answers to a series of social, cultural, and scale issues. The structure of the building relies on prefabricated pods, which contain one of the main functions of the unit. Their composition and positioning were generated by mathematical equations. There are striking formal similarities between the Kafka Castle and Habitat'67, their deconstructed appearance as much as the level of porosity and individualised orientation of each unit. Developed and built in the same period, the Nakagin Capsule Tower in Tokyo by Kisho Kurokawa (1972) represents one the most exciting experiments of the realised Metabolist utopia in Japan. Here too the constructive system based on the use of "capsules" show the architects' intention of applying this prototypical tower to mass production. Other examples are the Robin Hood Gardens by Alison and Peter Smithson (1972) and the constructive system of Multiplus by Paul Chemetov (1973) specifically designed to address the high demand for social housing in France.

Singapore, or the frontier of the new utopia

Even though the aforementioned "realised utopias" have remained isolated examples of a discussion that mainly took place on paper (drawings, books and journal articles), they have contributed to develop urban imageries for the future city. Most recently, China and Southeast Asia have offered concrete opportunities for large urban developments to those architects - like Safdie - who have promoted new strategies to deal with the problem of density. The corporate-state of Singapore is now perceived as the most experimental workshop for urban investigation and elaboration of utopian visions, a place where foreigners can "project their wishes and fears" (Jencks, 2016). Since the beginning of Singapore's Renaissance at the end of the 1960s. the Corbusian Ville Radieuse model has been adopted for public housing developments,¹ with the inhabited concrete slabs scattered in the luscious public landscape of the tropical island (Summ & Hassel, 2011, p. 22). Greening as an urban strategy has reached such a level of sophistication that the Howardian model of the city garden has been surpassed by the idea of Singapore being a "city in a garden." The Ministry for National Development and National Parks Board of Singapore have programmatically updated their project from "garden city" to "city in a garden."² Safdie's motto "for everyone a garden" has been exponentially multiplied until the point that the Urban Authority of Singapore enacted a regulation, bringing the green plot ratio to the value of 100% over the horizontal surfaces of every new building from 2007.



Fig 4. WOHA (2015). SkyVille@Dawson, View [Courtesy: WOHA, Singapore. Photo by Patrick Bingham-Hall].

The connection between Singapore and Safdie has to be traced back to Habitat'67 and its three-dimensional constructive system. Amongst those who were interested in his prototype. Robin Loh. a Chinese-Singaporean shipbuilder, approached Safdie aiming for the utilisation of his shipyard's surplus capacity to build three-dimensional modules for different locations and condition in Southeast Asia (Safdie, 2013, p. 28). The project was certainly exciting, however out of the many prototypes and projects developed, it remained on paper. Only in 1985 Safdie was able to build in downtown Singapore a guite modest intervention: a condominium named Ardmore Habitat (Safdie, 2013, p. 28). An unbuilt project, the residential development of Simpang (1992-94), had certainly a greater impact for the future commissions of Safdie in Singapore. Invited by the Singapore Housing and Development Board to develop a new town of 125,000 people, Safdie had the possibility of collaborating with the local authorities and architects on the theme of high density and new urban forms. According to Safdie, this design opportunity was determined in the bidding process that assured him the winning position for the design and completion in 2010 of one of the most iconic developments in Southeast Asia: the Integrated Resort Casino Marina Bay Sands (Safdie, 2013, p. 28). Retaining the idea of a "village within a city" here the architectural mass of this new highdensity mixed-use urban type is broken down in 3 split-towers, linked together by a large sky-park on top of the complex. A sort of "vertical town" that opens a new possibility of densification exploring the height of the building to achieve new possibilities. Beyond its aesthetic implications and its urban role in re-orienting the city's downtown, Marina Bay Sands has taken Safdie's experimentation of dwelling and mega scale further, giving him the possibility to realize the residential complex Sky Habitat (2015).

Singapore has recently seen the realisation of residential megastructures that envision a new way of considering urban dwelling. The Pinnacle@Duxton (2005-09) by Arc Studio and Skyville@Dawson (2016) by WOHA, commissioned by the Housing & Development Board of Singapore, deploy similar strategies to host a big population "in the air" (Fig. 4). These are two recently public housing complexes that promote a new way to build in the city. Skyville@Dawson presents many similarities to Habita'67, for its attention to common spaces, gardens and points of connectivity for the community:

Each home is designed to be part of a Sky Village comprising 80 homes that share a naturally ventilated community terrace and garden. Every tower is composed of 4 vertically stacked Sky Villages across 3 interconnected blocks (total 12 villages, 960 homes). Other communal areas include an Urban Plaza located along a public linear park offering a supermarket, coffee shop and retail spaces, Community Living Rooms at ground level that provide seating areas overlooking a Landscaped Park where enormous rain trees are retained and community pavilions for weddings and funerals, play and fitness areas, courts and lawns are designed around a 150m long bioswale. The Rooftop Park incorporates a 400m jogging track and pavilions that support a PV array that powers the common lighting. (Myall, 2016, para. 2)

A central issue to the design of the WOHA's Duxton Plain Housing competition project was "what Singaporean public housing should be," facilitating several scales of interaction. In so doing, WOHA (2016) proposes the Duxton Plain Housing as a sort of utopian manifesto for new forms of living in Singapore. Designed by OMA/Ole Scheeren, the gated community The Interlace (2007-13) presents a compelling radical approach to contemporary dense dwelling. The residential complex breaks away from the more standard isolated, vertical apartment towers typology (Fig. 9). Thirty-one apartment blocks, each standing at six-storeys tall and identical in length, are stacked in a hexagonal arrangement to form eight large permeable courtyards.

The volumetric complexity in which they are articulated, their giant dimension and the multiplication of the ground floor on different levels show a new approach to density. Not secondary is the support of local authorities, genuinely interested in a new positive understanding of density. In particular the multiplication of the ground floor and its public realm is a pivotal instrument for defeating the alienating separation from the ground in high-density developments.

Sky Habitat, "the realised utopia"

Since 2004, with a system of fellowships granted by the Safdie Architects office and conducted in the Boston office,³ the core of Safdie's design research has been concentrated on redeeming the dystopian and dehumanising reputation of megastructures and densification. In so doing, Safdie has initiated a conceptual shift from an ideological and obsolete understanding of mega-structure to a more contemporary idea of the "mega-scale," understood as a "vertical town" and not just "a building." Safdie has addressed the pressing issue of Bigness (Koolhaas, 1995b) with different but interconnected approaches, aiming to humanise the "mega-structure". Themes of the Safdie Architects fellowship include "Mobility on Demand," "Habitat of the future," "Tall buildings" and "Dense Urbanism." For instance, the fellowship "Habitat of the Future" aimed to reconsider some of the relevant issues explored in Habitat'67.

In deciding to embark on Habitat of the Future, we face the question, how might we do this today at the beginning of twentyfirst century? we must carefully define our objectives if we are to avoid an ambiguous drift, seesawing between questions of economics and density on the one hand, and amenity and liveability on the other. The following themes have guided the

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Habitat of the Future studies: regional adaptation, individualisation of the dwelling, buildability, density and mixed-use and structural simplification. ("Habitat of the Future 2007-2008" n.d., para. 3)

High-density residential developments targeting middle and upper class markets in Singapore and China are the tangible design outcomes of such research. Sky Habitat completed in 2016 in Singapore, the Golden Dream Bay residential development in Qinhuangdao (2016) and Chaotianmen mixed use development in Chongqing (design phase), China are a step forward towards the use of mega-scale applied to residential dwelling in the Asian magalopolis. As curator of a special issue of *L'Arca* in 2011, Safdie proposed "humanising megascale" as its red thread posing evident emphasis on the urban binomial density and dehumanising conditions (Lubin, 2016; Safdie & Lubin, 2015; Safdie, 2011).

The 38-story Bishan Residential complex (2015), located in the North part of the island of Singapore, on the metro-line that moves a large number of residents to downtown and Marina Bay, is most commonly known as Sky Habitat, referring to its direct precedent Habitat'67. The complex is representative of high-density, high-rise upper-middle-income urban housing, a typology that is in great demand in Singapore as well as in many other Asian cities. The new complex presents evident formal similarities to Habitat'67, in particular for its fragmented profile generated by the individuality of the apartment boxes and their private terraces.

In this scene of intense urban experimentation, it's no surprise that the gated community Sky Habitat and the public housing Skyville@ Dawson have been shortlisted for the "The International Highrise Award 2016." They are understood as belonging to a new generation of residential complexes that address the issue of density in the city on new premises. Instead of saturating the space and consuming land, they concentrate the volume exploiting the height of the building through the multiplication of the ground floor (Figs. 5, 6), the abundance of common spaces with semi-public access and the isolation of apartments (Figs. 7, 8). All these design solutions, refined to different degrees according to the budget, allow for natural ventilation and light, privacy, individualisation and multiple possibilities of social interaction. Although they are not mega-structures, these complexes advance the idea of expanding into the sky, allowing for more architectural variety, vertical development and sustainable solutions (Figs. 9, 10).⁴ Fig. 5 Moshe Safdie (2016). Sky Habitat, Section – the multiplication of the ground floor [Courtesy: Moshe Safdie Architects, Boston].



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Fig. 7 Moshe Safdie (2016). Sky Habitat, Plan of the 26th floor – one of the three landscape bridges [Courtesy: Moshe Safdie Architects, Boston].



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Fig. 8 WOHA (2015). SkyVille@Dawson, Plan of the 14th floor – one of the four hanging gardens and community areas [Courtesy: WOHA, Singapore].







Fig. 9 Moshe Safdie (2016). Sky Habitat, Landscape Bridge [Courtesy: Moshe Safdie Architects, Boston. Photo by Edward Hendricks].

Fig. 10 WOHA (2015). SkyVille@Dawson, Aerial passages serving the common areas [Courtesy: WOHA, Singapore. Photo by Patrick Bingham-Hall].

1 \rightarrow Singapore has a long and robust tradition is social housing - with a total 80% of the population live in public housing.

 $2 \rightarrow Supporting documents are published in the official government website: http://app.mnd.gov.sg/.$

 $3 \rightarrow$ "Following twelve years of teaching at the Harvard Graduate School of Design, Moshe Sadie formed, within his Boston office, a research program in order to pursue advanced investigation of particular design topic. The underlying premise of this practice-oriented fellowship is that research into and development of speculative proposal, outside normal business practice constraints, is crucial in developing fresh solutions to commissioned works. Each year Mosh Sadie targets a general theme that guides the work of the fellows and the staff." ("Safdie Architects - Home", 2016).

 $4 \rightarrow Images$ 5, 7 and 9 of Sky Habitat (Safdie) and images 6, 8 and 10 of Skyville@ Dawson (WOHA) are intentionally coupled. Within the theme of housing reinvention, the comparative approach shows the relationship between the organizational principles of collective functions and circulation with the housing units.

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