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# Toronto's Modern Suburbs and the Concrete High-Rise

**Graeme Stewart** 

E.R.A.Architects Editor

'In Toronto, an unusually large number of high-rise apartments poke above the flat landscape many miles from downtown.... [T]his is a type of high density suburban development far more progressive and able to deal with the future than the endless sprawl of the U.S...."

Buckminster Fuller, 1968

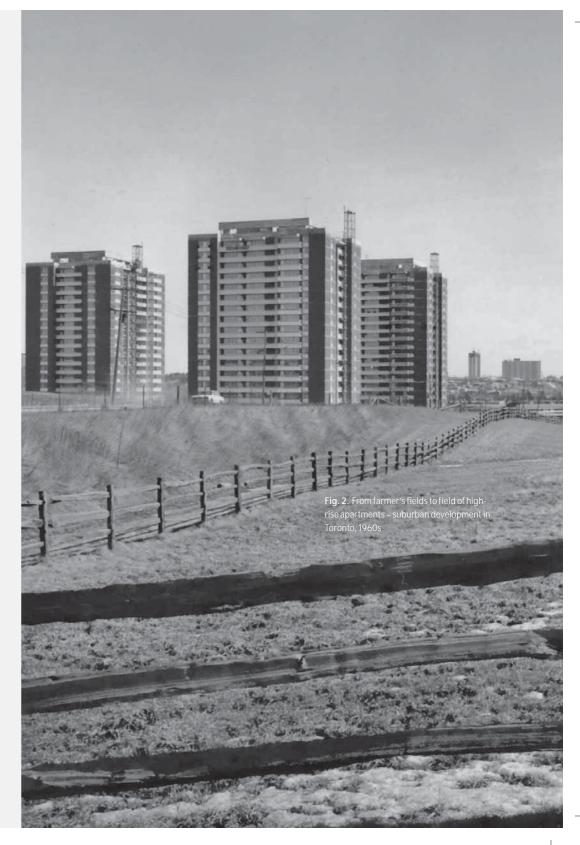
Though the vastness of Toronto's suburbs is often bemoaned as unplanned sprawl, their shape tells a different story. Containing extensive parks and protected natural systems, transit infrastructure, industrial zones, cultural and community facilities, universities, modern planned communities and, perhaps most noteworthy, hundreds upon hundreds of high-density concrete high-rise apartment buildings, Toronto's 'metro' suburbs showcase a process of metropolitan growth highly affected by regional and modern planning. Financed by the economic boom of the '60s and '70s, these expansive areas of Toronto take on a form unique to North America and perhaps the world.

Created in 1954 as the only metropolitan government in North America other than New York, Metropolitan Toronto administered a rapidly growing region that was more rural than urban. Aiming to fill inside its borders and leave what lay beyond untouched, Toronto engaged in a series of urban experiments located in what are today known as the GTA's 'inner suburbs.' This has left the city a remarkable modern and concrete legacy.

In the wake of the formation of Metro, Toronto became an attractor for internationally trained modern planners. Some were lured by the booming economy, rapid growth and the promise of regional planning via the metropolitan government, while others defaulted to Toronto due to McCarthyite politics south of the border.

Among the notables was Briton Gordon Stevenson, a leader in welfare-state planning who was deeply involved in establishing the U.K.'s New Towns Act, legislation encouraging the creation of dozens of modern planned satellite communities around London and other large cities. While in Toronto, in addition to work with the planning department, Stevenson served a brief tenure as the director of the nascent school of planning at the University of Toronto. Another import was E. G. Faludi, a Hungarian-born, Roman-trained, modern architect and planner who was an early advocate for Toronto's adoption of the tower-inthe-park. His early planning work, dating back to the 1940s, helped shape the region, particularly the boroughs of Etobicoke and North York. Perhaps the most infamous of these characters was German-American émigré, modern planner and card-carrying Communist Hans Blumenfeld. Though later villainized as the architect of the city's highway system, he was also largely responsible for establishing regional rail transit (now the GO system) and advocated for employment, commerce and mixed-housing types throughout the Metro area.

In conjunction with professional imports, a significant number of local planners and designers received modern training internationally, while at the University of Toronto, faculty successfully pushed for a modern curriculum within the design schools. The resulting combination of an eclectic mix of eager professionals, as well as a regulatory framework enabling the implementation of large-scale planning, set the stage for urban growth that was highly influenced by modern ideas.



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This might explain the early success of developments such as Don Mills, Thorncliffe Park and Flemingdon Park, the plans for which were approved in 1953, '55 and '59 respectively. Beginning with E. P. Taylor's famous Don Mills, these communities were loose interpretations of the satellite town, a concept that had gained currency since the turn of the century, but had never been fully implemented on this side of the Atlantic. Macklin Hancock, who designed the Don Mills project while finishing his master's degree at Harvard, brought these European ideals to the farmers' pastures of north Toronto. These ideas were pushed further in the Thorncliffe and Flemingdon communities, which included large numbers of high-rise, tower-in-the-park apartments, a move that would have a significant impact on the future shape of the region. Providing industry, shopping, mixed-housing types, ample natural open space, and insisting that all structures be modern in character, these neighbourhoods quickly became a showpiece of high design (concrete included) and an attractive alternative to living downtown.



Fig. 3. Model of Flemingdon Park, late 1950s



**Fig. 4.** Shops, elementary school and high-rise apartments: Flemingdon Park under construction

The introduction of high-rise towers met the growing need for rental units, and helped organize housing in high-density concentrations to better align communities with Metro's services. Influenced by similar European efforts, such as the high-rise new town of Vallanby in Sweden and London's Roehampton, and privately financed through a series of partnerships including a New York real-estate conglomerate, these communities illustrate a bold change in suburban planning internationally. They were a loosely European plans implemented by the North American free market. The result is unmistakably Torontonian, with local architects Irving Grossman and Raymond Moriyama providing the high-quality housing and cultural facilities that give these areas much of their lasting character.

Although the master-planning approach to these early experiments didn't take hold, building suburbans tower did. Subsequently, the suburban high-rise became the most popular housing type for a period of nearly 20 years, representing some 60 percent of the development market. Thirty-thousand high-rise units were built in 1968 alone. Highways, arterials, ravine sites and the edges of bungalow communities were flagged by planners as preferred zones for apartment development, and developers were more than happy to oblige.

For the most part privately developed but publicly directed, the region was neatly organized into natural areas, and employment, institutional and residential zones, all contained within Metro's borders. Archival photographs illustrating fields of 30-storey towers at Metro's northern edge on Bathurst Street, adjacent to undeveloped pastures north of the Steeles Avenue 'greenbelt,' recently prompted *Globe and Mail* reporter John Barber to proclaim:

Not since the first bird's-eye views of the Italian Renaissance has a city looked so coherent: the densely human, heavily built-upurbeendingabruptly-and totally-at an ancient wall heavy with meaning, the Arcadian rus rolling unbroken to the horizon in striking contrast ... Although the wall surrounding 1960s Toronto was made of policy, not stone, the meaning was still there. No other city in North America built high-density suburbs like these during the long post war boom. Few modern cities in the world, if any, were better planned than Metropolitan Toronto.



**Fig. 5.** Bathurst and Steeles, the edge of Metropolitan Toronto, 1960s

Toronto is perhaps the only place where neverending seas of bungalow subdivisions and concrete high-rises coexist as the typical suburban landscape. In some respects sharing closer affinity to outer Paris, Belgrade or Moscow than to the suburbs of our American cousins, Toronto's experience with modern planning has produced results unique to this continent. This perhaps calls into question the standard reading of our region and points to an enormous resource of modern dwelings worthy of further study.

In addition to housing, the suburbs of the '60s and '70s were programmed with shopping centres, religious institutions, community facilities, transportation infrastructure and universities during a period of remarkable architectural experimentation, particularly with concrete design. This provided a venue for the likes of Grossman, Dickinson, Parkin, Andrews, Moriyama, DuBois, Erickson, Prii and a long list of other giants of the era who help define the 'golden age' of modernism in Canada through their work in Toronto's periphery.

It might be argued that modernism got its start in Toronto in the suburbs. It certainly had its greatest impact there. Not all of the original ideas were realized, nor all of the results successful, yet the quality and diversity of projects speak of the climate of social investment, regional planning and great optimism, for which today there is a palpable nostalgia. Approaching half a century, this period of suburban growth deserves a second look. The articles that follow shed light on several of these remarkable projects.

#### Note

1. John Barber, 'Neglected High-Rises Hold the Key to a Sustainable Future,' *The Globe and Mail*, May 27, 2007.

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## The Age of Modern High-Rise Construction

#### Ivan Saleff

Architect, Assistant Professor, Faculty of Architecture, Landscape and Design, University of Toronto

'We must create the mass-production spirit. The spirit of constructing mass-production houses. The spirit of living in mass-production houses. The spirit of conceiving massproduction houses.

Le Corbusier, Vers Une Architecture, 1923

The esprit nouveau Le Corbusier championed so long ago, during the age of the machine, was ironically reincarnated in the space age. The purist paradox of classical formalism married with contemporary technologies and modes of production was to redefine affordable shelter in Toronto. The sublime non-stylistic aesthetic of Canadian poured-concrete grain elevators that so inspired Le Corbusier would thrive in this post-Levittown age.



Fig. 7. Thorncliffe Park under construction

The Jetsons were on TV. Yorkville was electric. Neil was young, McLuhan was in fine form, Revell's City Hall design materialized complete with Moore's Archer, and the Beatles, the Stones and Zeppelin were in the air. The Maple Leafs were a dynasty. While our siblings south of the border experienced the '60s as turbulent times, Toronto optimistically embraced the decade as the beginning of a new world. A variety of lifestyle choices offering new directions appeared. High-rise living was one of them.

Not since mountainside cave dwellings had such panoramic views from one's home been available. Autos were neatly stabled in the concrete belly of the tower, with speedy elevators on hand to transport occupants to their homes above. Swimming pools, landscaping, furnished lobbies, inspired entry canopies and multi-purpose rooms were among the amenities helping to convey a perception of luxury modern living.

For a 20-year period beginning in the early '60s, high-rise living embedded itself in Toronto's housing consciousness. A rare alliance occurred of unprecedented population growth and market demand, affordable urban and suburban sites, demographic characteristics, planning policies, opportunistic developers, a robust labour force and new technologies. This fertile scenario was in great part anchored by an ancient recipe of water, sand, cement, aggregate and slender steel rods. Reinforced concrete structure became the system of choice.

The technology of the reinforced eight-inch concrete one-way slab and shear wall construction provided the city's residential high-rises with highly efficient and durable armatures.



Fig. 8. Thorncliffe Park emerging from the Don Valley

The simple redundant six-metre spans complemented both unit layouts and below-grade parking. The introduction of flying-form technology, coupled with advancements in crane design, generated taller buildings. Twenty storeys high, 200 units, with two levels of below-grade parking, became a standard.

Rectangular slabs, square point towers, Y-shaped and cruciform plan typologies began to appear all over Toronto's urban and suburban horizon. The subsequent increase in living units relative to building footprint dramatically reduced construction costs on a per-unit basis. Substantial densities were achieved with relatively comwas to replace cramped, antiquated Parisian slums with 20th-century shelter, elevating the quality of life of its inhabitants. The agenda of our space-age megaliths was less altruistic - rather a rapid response to enormous demand.

These ordinary, underappreciated, aging megaliths may once again transform Toronto's horizon. Their sturdy poured-concrete skeletons for the most part are still in the early stages of their life cycle. Their solid-masonry exterior walls and infrastructure have, however, reached a durability threshold. Contemporary environmentally responsive over-cladding and other strategies offer viable vehicles for rehabilitation and aesthetic transformation. (See Durability, page 314.)

The present and future value of Toronto's vintage high-rise housing inventory is indisputable. How such a seemingly monolithic construct, virtually pact footprints. Le Corbusier's idealistic vision medieval in its materiality, can continue to be relevant into the next century is a testimony to both the durability of the typology and its system of choice.

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## The Flying Form and Development in Toronto

#### Lewis Poplak

Context Development

A harsh winter wind buffets the tarpaulin-walled 11th floor of a Toronto condominium building under construction. Here, gas-fired heaters work to maintain a minimum temperature required for concrete to undergo its exothermic setting process. Overhead, a tower crane boom swings as it lifts a palette of flying formwork from the 12th to 13th floors, where a contingent of workers will knit a mesh of steel rebar into the plywood and metal form, readying it for the bucket loads of wet concrete hoisted from the street below.

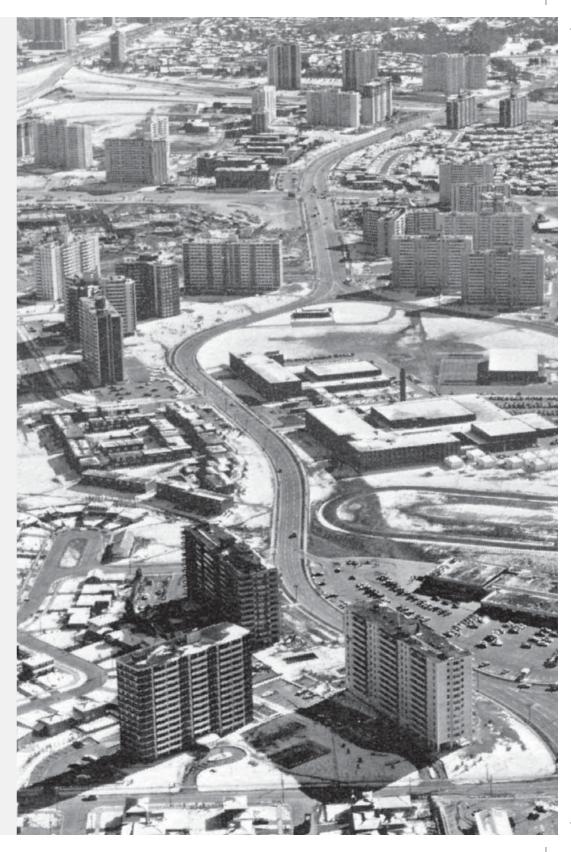
This scene typifies the landscape of a 21stcentury Toronto residential construction boom. The industry-standard construction method is called flying-form concrete construction. It was born out of an ingenious response to increased labour costs and an ever-diminishing labour pool in Toronto's construction industry of the 1960s. Using the innovation of the climbing tower crane, first aluminum and eventually plywood forms moulds – were hoisted from storey to storey as the building was constructed. This replaced the earlier handset-form method, and was not only less labour-intensive (a typical handset form was at largest two by four feet and had to be disassembled to move to the next floor), but also allowed much larger forms (10 or 15 feet in width), thereby greatly reducing the time it takes to construct a building.

Flying-form construction literally raised the roof in an apartment building market that had previously been comprised primarily of six- to eight-storey buildings, and introduced Toronto to the high-rise residential tower of 30 storeys and beyond. High-rise slab apartment buildings spread across the city, towering like *War of the Worlds* Martian tripods over Toronto's sleepy

bungalow neighbourhoods. Working hand in hand with the creation and expansion of Toronto's highway and subway systems, starting in 1954, the flying-form-constructed apartment building helped Toronto's population double from 1 million in 1951 to 2 million by 1971. Toronto's flying-form innovators are regarded to have been the developer/builders the Greens and the DelZottos, as well as builder Nick di Lorenzo. (Engineers who worked on early flying-form buildings include Jablonsky and Yolles.)

The extremely efficient construction made possible through the local perfection of the flying form has made high-rise housing a defining feature of Toronto and its suburbs for nearly half a century. Though still popular for its simplicity and ease of construction, the double-loaded slab building of the past has been joined on the development scene by a building type - the point tower - that lends itself equally well to flying-form construction, but has a more elegant and less intrusive profile on the skyline. In the point tower - typically having a floor plate of 8,000 square feet or less, shear walls are placed in a cruciform, rather than parallel, pattern. While the '60s apartment boom has given way to today's condomania, vertical living enabled through concrete construction continues to be fundamental in shaping our city and how we live in it.

**Fig. 9.** High-rise apartments emerging around the 'Peanut,' Sheppard and Don Mills Road



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## **Uno Prii: Sculptor in Concrete**

#### Alfred Holden

Writer, and editor of the Ideas section. The Toronto Star

'It comes as a liquid,' an interviewer reflected, talking with Uno Prii about concrete in 1999. 'And you took that and you made it into sculptures.' Prii liked the idea of buildings that were not repeating patterns, but more flowing, sculptural wholes. Spurred on by the zoning laws of the 1960s (which in the Toronto region commonly encouraged free-standing towers on large lots), and the ease and economy with which such towers could be built using the new flying forms (reusable moulds allowing his concrete designs to be poured 'without interruption,' as *Canadian Builder* reported in 1964), the architect produced some of Canada's most distinctive urban and suburban residential architecture.

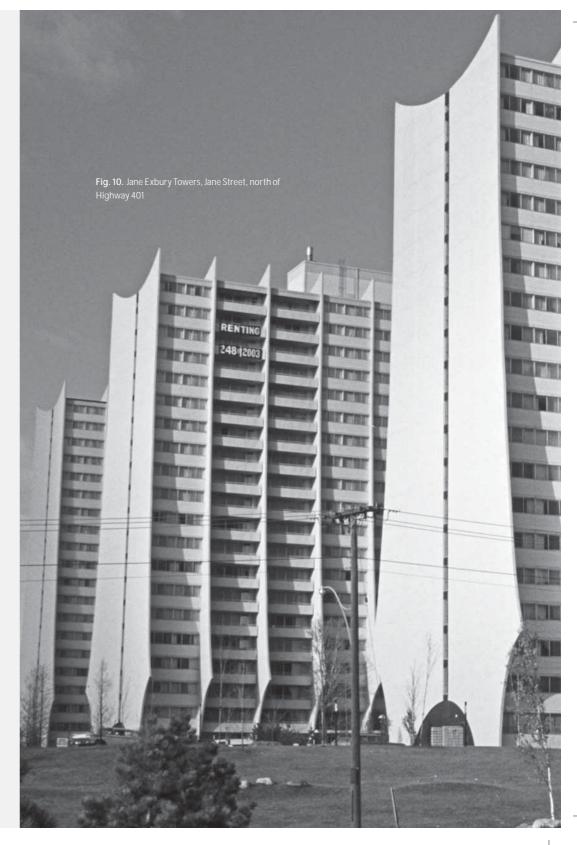
Prii's 22-storey apartment tower at 20 Prince Arthur Avenue, in Toronto's downtown Annex district, looks from the side like a soaring pair of bell-bottom pants, flaring fashionably at the base (mod meets medieval; Prii said he was inspired by the flying buttresses on European cathedrals). A few blocks west, 44 Walmer Road offered a point tower whose undulating facades of balconies were dressed (until regrettable alterations) in a fabulous railing of steel panels with circular cutouts, bisected by thin, straight lines of metal. The circle theme repeated in cutouts in the concrete entrance canopy and the building's round fountain, where water shot from a concrete trumpet beneath intersecting arches.

Prii ambitiously embellished the era's slab apartment houses. A stylized rendering of a project for Belmar Realty on Jane Street in the Toronto suburb of North York shows the proposed building in profile. The shape flares out, then tapers back as it rises to soaring points. The only straight line is an indentation that rises from base

to summit in the sculpted bookend. At intervals along the front and back of the slab, matching protrusions repeat, so the building seems supported by a series of these abstract forms. The grouping of five similar buildings eventually constructed to this design on Jane Steet north of the 401, ('the Exbury buildings'), presents a startling artistic installation visible, among others, to airline passengers on approach from the east to Pearson International Airport. In Prii's own words, 'I could see apartment buildings as giant sculptures. I thought people would remember these buildings.... I got tired, eventually, of these straight boxes,' he remembered. 'I thought, "Let's have a little fun."'

Uno Prii was born in Tallinn, Estonia, on February 28, 1924, the son of an engineer-builder. Given a pen and bottle of brown ink for his 10th birthday, he immediately showed his aptitude and got high grades for drawing in school. He left Estonia in 1943 during the German occupation and joined the Finnish navy, and after the war he earned a degree in engineering at Stockholm Technical Institute. In Sweden he married Silvia, whom he'd met in Estonia, and in 1950, after Prii enrolled by mail in the University of Toronto's School of Architecture, the couple moved to Canada.

At U of T, Prii scored top marks despite his poor English and was hired to work summers at Fleury & Arthur, the partnership of one of his professors, the famed, eccentric Eric Arthur. Opening his own practice in 1957, near the beginning of a high-rise apartment-house boom, Prii initially executed commissions he later called 'unrecognizable from other apartments.' But he began offering more expressive designs – 'a few clients were sympathetic.' His breakthrough came in



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born carpenter-turned-developer whose principal instruction was 'Just don't bankrupt me.' Prii, helped by his engineering background and some hand-holding with concrete contractors ('Oh no, you can't do it,' the architect recalled one responding to an unusual specification), was able to express himself within a market-driven

budget.

meeting Harry Hiller, an enterprising Polish-

The architect's best-known buildings have been compared to the embellished Miami modernism of Morris Lapidus, whom Prii admired. They won no awards from a generally skeptical architectural establishment, and at one point *Toronto Life* ranked 44 Walmer with Robarts Library as among Toronto's five ugliest buildings. This outsiders' opinion notwithstanding, Prii's creations were popular with tenants, among whom they have had cult status for a generation now; in recent times there has been a reappraisal of their significance and they have enjoyed acclaim as among the most original works of the period.

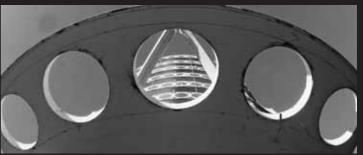
'Uno Prii's buildings were a shock to the Toronto of his day,' members of the Toronto Society of Architects wrote to Toronto's preservation board in 2003, supporting the inclusion of a number of Prii's buildings on the city's list of heritage properties. 'While dealing with the difficult economies of private development, often for rental houses, his buildings showed an unbridled enthusiasm for newness and innovation.'

Responding to old controversy and new praise in 1999, Prii put it more simply: 'My designs are original. And originality is the hardest thing to come by.'

Fig. 11. 88 Spadina Road, south facade







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Alfred Holden You're quite famous now for your work in Toronto, but have you done

 $any \, work \, outside \, of \, Canada?$ 

 $Uno\ Prii \qquad Yes, I\ did\ some\ apartment\ buildings\ across\ the\ lake\ in\ Ohio\ and\ I\ had\ one\ Toronto$ 

client who had lots of properties in Miami, so I did some buildings over there.

Alfred Holden You did some in Miami?

 $\label{thm:continuous} Uno\,Prii \hspace{0.5cm} I\,did\,the\,design, and\,my\,client\,took\,my\,design\,to\,Miami\,who\,hired\,a\,local$ 

architect who did the working drawings.

Alfred Holden Did you ever meet Morris Lapidus?

Uno Prii I never met him, but I know him very well! I saw lots of his buildings in

Miami. I quite actually liked what he did.

Alfred Holden What did you like about his designs?

Uno Prii Well, I thought that some of his things, at that time – mind you, I won't

compare it to what we have now – were quite flamboyant. His buildings were white. In Toronto, at that time, everything was dark, grey, or grey and brown. Our climate wasn't exactly sunny, so maybe it fit into the surroundings, you

know, but this was an improvement. It made it more cheerful.

 ${\bf Alfred\, Holden} \qquad {\bf You\, chose\, white\, for\, a\, lot\, of\, your\, buildings.}$ 

Uno Prii Oh yes.

Alfred Holden So Lapidus's buildings were one of the influences?

Uno Prii I would say yes, that was one of the influences. But actually I wasn't

influenced by what Lapidus did, design-wise. I just liked the whiteness of the buildings. And not only Lapidus, but a lot of other buildings in Miami

were white.

Alfred Holden Your buildings have been compared to Miami buildings, having a sort

of 'exuberant' style.

Uno Pri You might say so.

Alfred Holden I interviewed some people who lived in one of your buildings when

they were new and they said it was very glamorous to move into one of

your buildings.

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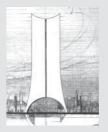
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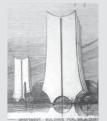
Figs. 14, 15. 20 Prince Arthur, perspective, elevation

Fig. 16. 35 Walmer, perspective

Fig. 17. Jane Exbury Towers, perspective







Uno Prii I'm glad to hear it! Now at 20 Prince Arthur, they just renovated it a few years ago - new owners, and they did a fabulous job, painted the building. It looks like brand-new.

Alfred Holden That's your favourite one, isn't it?

Uno Prii My favourite. I guess so.

Alfred Holden Did your clients just want cheap buildings and walk away when you gave them something more exuberant?

Uno Prii Some of them. But others absolutely liked what I was doing. One of them was Alan Schiff. He built those buildings at Jane Street, just north of the

Alfred Holden But you weren't involved in the development part, I gather. You were what they call a full-commission architect. That is, you didn't invest yourself.

Uno Prii Right. If it had to be done, I'd get involved in rezoning, especially in the City

of Toronto. Around this I would design it, and they would build it.

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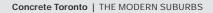


Fig. 18. Unrealized Uno Prii design

Fig. 19. Uno Prii with model of 20 Prince Arthur







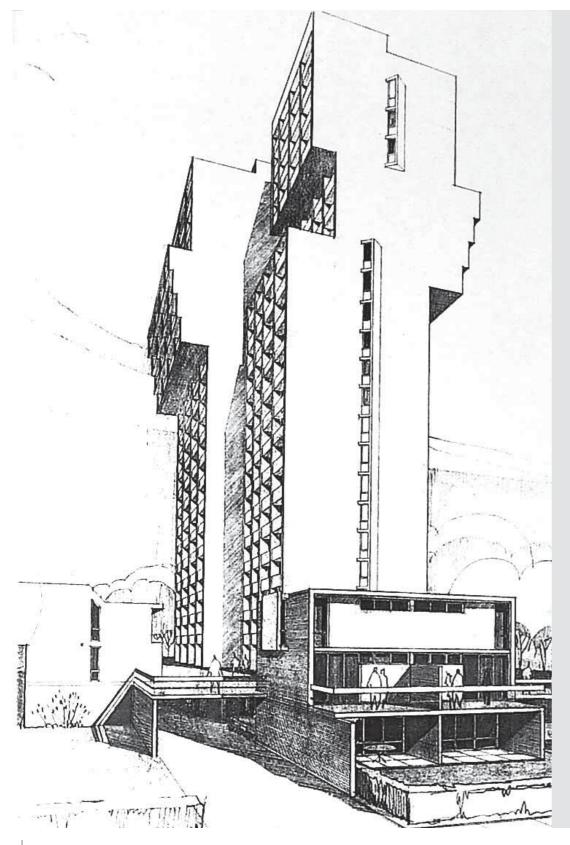
Alfred Holden I read a few older reports prior to this interview. One of them was the  $Faludi\,report\,on\,apartment-building\,development\,in\,the\,east\,Annex.$ The report talks about zoning requirements. What they seemed to require was bonusing – I think that's the right word they used – but basically you had to put your building on a lot with more open space around it. It seems to have affected a lot of your buildings.

Uno Prii I wasn't influenced by Faludi at all. But I had to do lots of redrawing, just to get approval to design something, build something. I did some perspectives for Faludi when I was a student, though I don't recall what for.

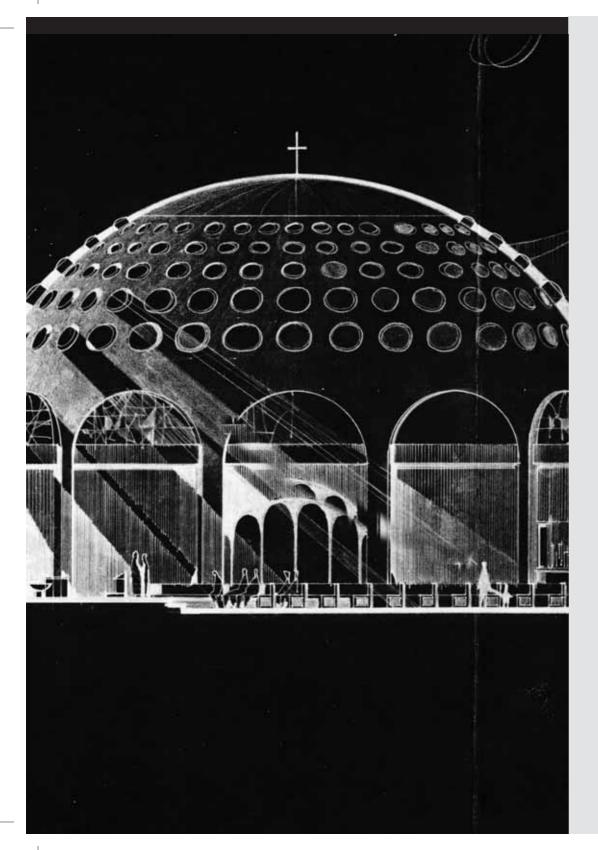
Alfred Holden Another subject I wanted to ask you about was flying forms.

Uno Prii That was actually a very good invention because it speeded up the  $construction\, considerably.\,I\, think\, I\, did\, the\, first\, reinforced-concrete$ apartment building, on St. Clair at the southeast corner of Russell Hill. And it was a great improvement. Before that, you couldn't really do much with apartments, it was simply block and brick. At that time, we had difficulty finding the workmen who knew enough about concrete formwork. But from there on it took off. Somebody invented the flying form, and there it went.

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Figs. 20, 21, 22. Unrealized Uno Prii designs



Alfred Holden Did you go regularly to the sites and do that architect's walk-around?

Uno Prii I would always have to go and see what they were doing – or actually, see what they were doing wrong. [Chuckles.] Which I did very often.

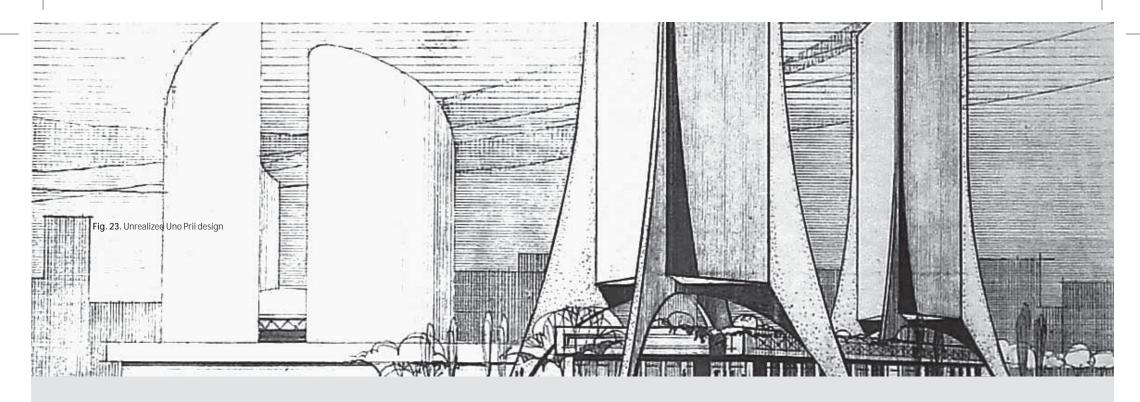
## Alfred Holden Are you doing any drawing today?

Uno Prii Not in summertime, but wintertime I sit where you sit over there and do little sketches of imaginary buildings, and then throw them away. It's a pleasant pastime to use your imagination as to what could be done. But on the other hand, I find that the architects today are doing very interesting buildings. Some of them, at least. They are no longer in the straitjacket of this Bauhaus thing, just square or rectangular block. That was the climate I was designing in.

# Alfred Holden Apartment buildings are really no longer built, are they? In Canada, or in Toronto.

Uno Prii Condos are being built. Rental housing is pretty well out. But condos, they're going up everywhere you go.

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Alfred Holden How is it the economics of the '60s allowed you to build fairly substantial concrete apartments for the middle class? These are not light, cheap buildings. And why is it they can't do that now?

Uno Prii Well, it is rental controls. And escalating prices. Condos are a different story. You build condos, 500 square feet, just like a little hotel room, and say \$100,000. Or they build half-a-million, million-dollar condos. Rich people always have the money. It doesn't make any difference what the economic situation is in the country. They have the money to buy it.

Alfred Holden So really the middle class who used to rent apartments, now they'll buy a condo.

Uno Prii Or they buy a condo and find it's a better deal than renting an apartment.

After all, there's an investment in there and one day you sell it.

Alfred Holden Maybe I should leave all the architecture behind for a second and ask you about your travels and your collection. One of the reasons I wanted to come here was to see what world you lived in.

Uno Prii [Chuckles.]

Alfred Holden Now, it looks to me like you've travelled all over the world, and collected.

Uno Prii Not all over the world, but I have travelled a lot, especially in Europe.

Uno Prii [Gestures.] Well, this one here is a Mexican painter, Leonardo Nierman. This painting is my painting. Acrylic.

Alfred Holden Now, you didn't mention that you painted.

Uno Prii Oh yes yes.

Alfred Holden Do you still paint?

Uno Prii Yes, yes. But I haven't got enough wall space. [The apartment walls are full of paintings.]

Alfred Holden Would you sell your paintings?

Uno Prii No. We had a big house on Old Forest Hill Road. When I moved over here, friends took this and this and this. I figured I haven't got space for it. But maybe one painting here or so. I love to paint the flowerpots.

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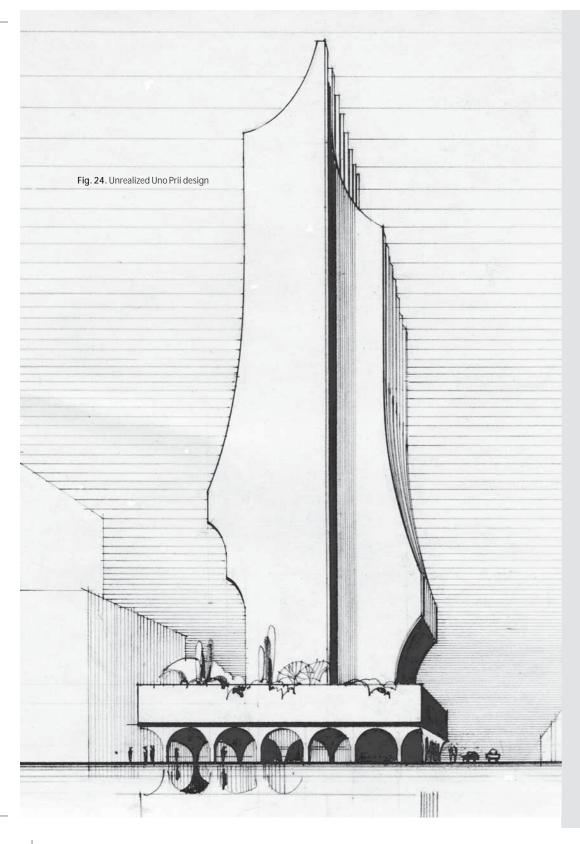
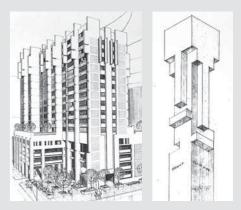


Fig. 25. Allen Brown Building, rendering

Fig. 26. Allen Brown Bulding, detail



Alfred Holden [Noticing.] Oh, yes. So you never embraced less is more, in terms of

Spartan. Blank

Uno Prii No, not quite. You know the famous saying, when some architect went to see the Seagram Building in New York, which at that time cost four times

any other office building, all in bronze: 'I've never seen more of less.'

[Chuckles.] I think that guy was right.

Alfred Holden Did you ever meet Mies van der Rohe at a conference or anything?

Uno Prii No, no no.

Alfred Holden I wonder what a conversation between you would be like.

Uno Prii At that time, I was a student, a young architect. If I would have met him I

probably would have been influenced by him, in some ways; after all, he was such a famous architect then. It would have been a thrill to meet him. I have met Viljo Revell. That was before City Hall was completed. He died

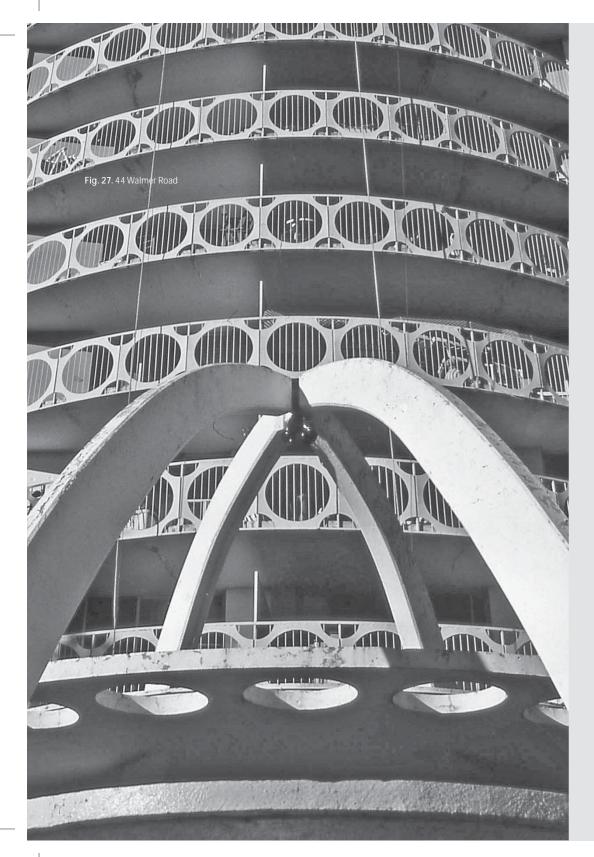
shortly after.

Alfred Holden So did you chat with Revell about City Hall?

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Uno Prii He was complaining that if he had known that the whole project would come in within the budget, he would have actually done some other things, which they had to cut out. His partners, who did the work, was Parkin Associates. But, anyway, as it turned out, it's a beautiful building. I like it

very much.

Alfred Holden What do you think of all the attention you're getting – people like me and also other journalists? Does it make you feel that maybe your

work -?

Sylvia Prii: I think it's wonderful, because it often happens if you are different, if you

are more original – it takes time, but you get recognized.

Uno Prii I'm gratified, personally. It's nice actually that now some people – there are a number of young architects who appreciate what I did. After all, it was my

life's work. It's something I appreciate.

Uno Prii passed away in 2000. His work has had an unmistakable impact on the urban landscape in Toronto.

GUIDEBOOK No. 41

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Durability Is Only Skin Deep

### Ted Kesik

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An extensive stock of high-rise housing in Toronto and throughout Ontario was constructed in response to postwar immigration to large urban centres. The building technology enjoyed the benefit of well-engineered reinforced concrete structural systems; however, advanced building-science concepts were not applied to the building envelope design. For the first three decades of this building typology's service life, the envelope performed acceptably and the low cost of energy did not place economic burdens on owners and tenants. With much of this high-rise housing stock now passing some 40 years of service, deterioration of the building envelope is widely evident and the cost of energy is increasingly significant. Conventional retrofits to achieve envelope energy efficiency and durability are often producing unacceptable aesthetic outcomes.

Research in the Faculty of Architecture, Landscape and Design at the University of Toronto, through a course delivered by Toronto architect Ivan Saleff, examined relationships between the skin (building envelope) and armature (structural system) in the context of facade-retrofit technologies that extend the service life of the skin while optimizing thermal performance and maintaining, if not enhancing, the traditional aesthetic character of the building stock. A building-science component of the research assessed roof, opaque wall and glazing retrofit measures in terms of their economic viability to owners. and these indicators were compared



Fig. 25. Typical concrete slab with exposed slab edge and masonry facade

with life-cycle cost analyses. The retrofit strategy holding the most promise involved integrated overcladding, which incorporates a secondary framing system that enables the updating and integration of building services in a space between the exterior insulation and the existing facade, and the introduction of features such as double facade systems for natural ventilation and sound control.

A building-envelope retrofit analysis was conducted on a typical 20-storey high-rise apartment building constructed in the 1970s. An integrated overcladding strategy was priced at \$2.72 million and yielded an annual reduction of \$241,000 in energy costs and 708 tonnes of greenhouse gases. Depending on the future escalation rate of energy prices, the payback period on the investment ranged from 8.3 to nine years, corresponding to an internal rate of return of 11.7 percent and 10 percent respectively. It is evident that a comprehensive overcladding strategy for postwar high-rise housing typology is costeffective, delivering a reasonable rate of return. Additional benefits not accounted for in the analysis are reductions in vacancy rates, increased market value, reduced maintenance costs and possibly the economic valuation of greenhousegas credits.

All of these potential benefits are achievable because concrete highrise housing possesses an extremely durable armature that can accommodate a succession of building skins, provided they are designed for obsolescence (i.e., ease of replacement). Historically, buildings were designed with excellent durability characteristics. This was largely due to the traditional nature of the structural and envelope systems employed. As a prime example, load-bearing masonry construction integrated armature and skin; hence the facade inherited the durability of the structure. Modern buildings have departed from this traditional



**Fig. 26.** Typical concrete slab with exposed slab edge and masonry facade

approach, but designers have not yet fully appreciated that with a separation between armature and skin, facades should be designed as sacrificial layers that will be replaced or ehabilitated several times during the useful life of a building. Magically, this DNA was incorporated into Canada's concrete high-rise housing stock.

Looking to the immediate future, there is a genuine need for considerable research and development of appropriate building-envelope retrofit strategies appropriate to highrise housing. Enforceable municipal design standards must be developed to maintain the architectural integrity of these valuable housing resources. Sustainable retrofit solutions derived from technical research and development may further require government to formulate incentives for invest-

ments in building retrofits, possibly in the form of property-tax credits and the brokering of greenhouse-gas credits for building owners.

The commodification of housing – that is, the notion of it being a commodity to be purchased and sold for profit – obscures its importance as a social and cultural resource. Aside from its intrinsic value as shelter and home, housing is a legacy left by one generation to the next. A question to be answered is whether this legacy will be viewed as an asset or a liability. The time to responsibly address the retrofit potential of our concrete high-rise housing has arrived, and the determinant of its durability is only skin-deep.

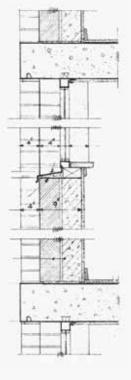


Fig. 27. Typical wall section with exposed slab edge

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