

But I did not give up completely. I still felt we had to build a project big enough to create large public areas below with an integrated commercial center because that was what Habitat was all about.

Instead of pursuing the idea of doing the ten-storey or twelve-storey section, I still attempted to keep the large rhomboids, twenty-two stories high. The minimum would be three rhomboids to support each other, and that meant twenty million dollars. I drew up a twenty-million-dollar scheme in two or three days of intensive work and went back to Churchill: "Well, we can do something, but it is going to be twenty million dollars."

Churchill spoke to a representative of the Treasury Board and called me half an hour later. He said: "Moshe, you just don't understand. It's eleven and one-half million dollars or nothing." Only then did the decision dawn on me in all its implications. I started to work on a modified scheme. I was given four weeks and a new design budget of forty-five thousand dollars to make a presentation of what could be done for eleven and one-half million.

The original design had two parts, a ten-storey section and a twenty-two-storey section where the commercial center was. What the government expected was that I would just do the ten-storey section and forget the other one.

I decided to place the building at the northern end of the pier because that's where the best view was. I redesigned it completely to create some notion of the public space that was in the original twenty-two-storey section. With the same modular box units, instead of cellular columns in inclined planes, I developed a cluster geometry. That was a basic change. Clusters of eight boxes would be piled one on top of another.

Once the actual construction budget was officially appropriated, the vultures really began to circle. I think the most dramatic example was the Y67 affair.

We had been in contact with a number of manufacturers and industries. Francon were sitting in on our job meetings as precasting contractors and advising us. We received word that the Camus Company, who are the largest prefabricated system builders in France, were considering extending their operations to Canada, and were very interested in looking at Habitat to see whether they could act as our precast contractors and help us technically. They hoped to use that as a kind of entrée to the market. We, of course, responded very favorably. Camus was a very large company, with a lot of experience in their kind of precasting.

A couple of months before the deadline for presenting the revised project to the government we had a phone call from their local representative, saying that Mr. Camus himself was arriving from Paris with his assistant, some general, and would like to meet with us to discuss participation in the project.

They all arrived, a very distinguished party, a great big tall general with a big mustache and Mr. Camus himself, two or three assistants and the local representative. We had asked Komendant to fly to Montreal especially for that meeting and to describe the progress of the work and the system we had in mind. They asked us to make available to them all our drawings, feasibility studies, cost estimates, the works, which we did. Everything. They said they would study it and come back to us about a month before the presentation had to be made and tell us in what way they could participate, help us, and act as contractors.

A few weeks passed by and we heard nothing. Then one day Eric Bell, of Community Development Consultants, came into the office and said he had heard rumors that Camus had commissioned local architects to design a scheme using their panel system and that they were making overtures to the government to dump Habitat and give them the budget to build their own so-called experimental project on the same piece of land, and because it was a conventional structure they would get more units per dollar than Habitat. I found the whole thing too fantastic to believe and dismissed it.

But a week later Eric Bell came back to report that Camus had offered to retain Andrews and Bell as their consultants to submit their design to the government to replace Habitat. I was shocked. What made it even worse was that instructions came down from Ottawa that the Camus submission was to be looked at very carefully. We heard that the French ambassador had made a special presentation to the Minister of Trade and Commerce. This coincided with a big political fight about the Caravelle and the DC9 aircraft. Air Canada was going to buy some short-range jets and pressure was being applied on behalf of the French Caravelle, even though economic analysis showed that the DC9 would be a superior plane for Air Canada. So there was a parallel situation in which diplomatic pressure with political overtones was being used.

Andrews and Bell found out that Camus were hoping to present their project in

Ottawa four or five days before our presentation was scheduled, and suggested we should move our deadline ten days ahead, to get to the government before Camus had a chance to make their presentation. That was pretty tricky, because we had already been working fourteen and fifteen hours a day, even Saturdays and Sundays. To move the deadline at the last minute would take an almost impossible effort. Nevertheless we decided to do it. We worked like dogs and got the presentation ready for the revised date.

Representatives of Central Mortgage, Expo, and Treasury Board came down to Montreal. I had a new model and new drawings. The meeting was in my office, in the open so all the staff could hear what was going on. The Ottawa people looked at it. It wasn't what they expected. They had expected a piece of the ten-storey building from the original scheme. They liked it. On October 28th, 1964 they told us to proceed with the plan for a hundred and fifty-eight units as they had seen it.

Three days later Camus made their presentation. It arrived in the form of an eleven by twelve leatherette-bound book, at least two and a half inches thick, with many dockets in it presenting the design, the system, the economics. It was very lavishly printed using the finest Swiss graphics, expensive paper, and fancy binding. The written portion of their report was a paraphrase of our feasibility study. The project was called Y67 (why indeed!); a series of apartment towers cantilevering outward in the shape of a Y gave the project its name. These apartment buildings were projected to run all the way down the MacKay Pier on the Habitat site. The architects were Papineau, Gérin-Lajoie, Le Blanc, a Montreal firm, who must have known that the project was being proposed for a site already approved for Habitat.

Shaw and Churchill handled it very carefully. They asked Tony Peters, Expo's project architect for Habitat, and his staff to make an evaluation of the proposal. Churchill called a meeting with Camus' architects and representatives and listened to the presentation. It was rejected after Tony wrote a comprehensive report on why it was thought to be inappropriate. The funniest part of it all came seven months later. Tony called me one day and said, "You know what we just received? A bill for a hundred thousand dollars from Camus."

Shortly after we got the go-ahead on the working drawings for Phase One, Peter Barott died of a heart attack. He was forty-two. He was the partner in David, Barott, Boulva who was working on the project. I was very fond of him.

We were hiring engineering consultants and discovered that many were quite skeptical about the building. We lost two or three along the way, and the one who did stay with us was questioning everything in a way that was detrimental to the progress of the job.

The difficulty with Komendant's concept was that there were three structural

elements in the building: the boxes, which were load-bearing; the pedestrian streets which were also beams carrying both horizontal and vertical loads, earthquake and wind loads; the elevators and stair towers. The whole thing was one continuous, integrated, three-dimensional structure, technically known as an indeterminate structure. Loads are transmitted in complex patterns. Higher mathematics and limit design had to be used to determine what would really happen.

With a beam on two posts you know exactly how much load is coming onto each support. But here, we were not designing for a single condition because the structure did not behave as a simple structure. It was one of the most complex structures to analyze ever built. Komendant in his old-fashioned way did not use computers. We had difficulty in getting others to accept the validity of his computations or even to understand his approach, and since they were to share the responsibility it was no good having them say, "You can't do that." If one thought of it as a post and beam building, it really didn't work.

I realized that every building has to be submitted for a building permit, that probably the engineering department of the City of Montreal or Expo wouldn't be able to assess the structure, and that we were going to have a problem. I discussed it with Tony Peters and we proposed that Expo hire a special committee of distinguished engineers to review the building. There was Professor J. O. McCutcheon, the chairman of the civil engineering and applied mechanics department at McGill University; Professor G. K. Kani, a noted structural engineer from the University of Toronto; and a third member. They had one brief meeting with Komendant when he was doing his preliminary studies and two or three other meetings with his local collaborator. When the report came in it said that the building as designed would collapse. To make things more difficult, we were just about ready to move in with foundation drawings and complete them so that we could start calling bids. Expo was making commitments, e.g. we had ordered a crane because if we hadn't we wouldn't have got it on the site in time.

The report commented on Komendant and his collaborators and recommended that "competent" engineers be hired to handle the job. There were a number of criticisms: no expansion joints were provided; and *certainly* one could not make an earthquake analysis without an elaborate computer program, which would take months.

I read the report and said to Churchill, "If you give me that officially we will have no choice but to sue the committee for libel." I felt that even though not all the information had been available at the preliminary design stage, they had not asked questions; they had merely made a negative report on incomplete evidence. I could have understood if they had raised questions or wanted more information, but they just categorically said it wouldn't work. Churchill didn't give me the report. He wrote a letter to our engineers paraphrasing it, turning their statements into questions: "How do you intend to deal with earthquake

design? How do you intend to handle expansion? Can you give us more information?"

This was the point where Habitat was closest to being called off. Many people in Expo opposed it. Gilles Sarault, Expo's chief engineer, was even refusing to sign the plans that were being produced. Politically it was becoming more and more difficult. The city was getting nervous about the criticism. It seemed as though everybody was saying Habitat would never be built – than a committee of the most distinguished engineers in the country says it won't even stand up.

Churchill said, "We have Komendant's word against these engineers, and Komendant obviously is a man with a world-wide reputation. What has he done in an earthquake zone?"

I said, "He has done the Salk Institute for Biological Studies, in San Diego."

"Who collaborated with him there?"

I named the firm.

He picked up the phone, got the firm's principal, told him the situation, what the committee was saying.

"How do you find Komendant? How do you consider his judgment? His ability to handle earthquake design?"

The answers satisfied Churchill. He said, "I want Komendant to answer my questions – and then we'll go ahead with it." Shaw made the decision with Churchill. The courage that took was remarkable.

The collaborating engineers were not producing drawings, and finally we had to replace them; Expo made them resign. Churchill and Shaw knew the Montreal firm of Monti, Lavoie, Nadon, and they were brought in. Monti spent three days, went over Komendant's computations, got on very well with him, wrote the report answering the professors' "questions," got the job, and off we went. By that time, we had already awarded the contract for the foundation on the basis of Komendant's preliminary structural drawings. For the rest of the job the contract stipulated that we would increase or decrease the payments according to fixed unit prices depending on how much concrete or steel was finally used.

Things were not settled with those professors for many months. The building was almost complete – one section was at full height – when Churchill thought that the matter should be officially closed. Monti was called in to meet them and said, "Well, gentlemen, it's up. I think that answers your report."

That was almost the last time Habitat hung in the balance.

As the project became more widely publicized a number of anti-Habitat crusaders emerged. By far the most vocal critic was Paul Trépanier, the mayor of the town of Granby and a former president of PQAA (the Province of Quebec Association of Architects). Trépanier's criticism intensified when the working drawings started. The closer the project came to reality, the more intense his criticism became. He gave a series of speeches to service clubs and interviews to newspapers. The crescendo of his criticism was a speech to the Canadian Club in which he called for a Royal Commission to investigate why such an "Insane Project" – the headline in the papers said – was being supported by Expo and the government. They were subsidizing millionaires' housing, he said, at the taxpayers' expense. The papers had a heyday with headlines, and I must say that I was becoming increasingly irritated.

Expo's way of handling it was very wise. They had scheduled a press conference to announce the award of the construction contract to Anglin-Norcross. They moved it forward and, three days after Trépanier's great attack, simply announced that they had awarded a contract to build Habitat.

But I got quite upset and when reporters called to ask for my comments, I said at one point that I would have to look at what he said, but that it seemed to me I might sue him. They had a ball with that. Eventually, I decided not to, but I felt it was proper for me to write the president of PQAA, because the statutes of the Association at that time forbade an architect to criticize a colleague in public.

Really I felt the statute was wrong in the first place. I've been saying for years that as long as architects are prepared to act under their own names, they should be able to say whatever they wish about the work of another architect. So, I didn't want to refer to a statute I disagreed with and I simply asked if PQAA itself wanted to intervene in the case. I was given a negative answer. I now regret that I bothered writing PQAA or even commenting to the newspapers, but at the time I felt very threatened, because there was always a chance that Trépanier's criticism could have killed the project.

Before the bids were called we had estimated the job at twelve and one-half million dollars, slightly over the budget. We had a bet and everyone in the office put in a dollar – a total of forty dollars. I had a separate bet with the estimators and developers. I estimated it would come in at twelve million and the estimators themselves thought that it would be fifteen million. Some guesses went up to twenty-two million. I won both bets. It came in at slightly below twelve million dollars. There were three bids, Anglin-Norcross Quebec was lowest, followed by the Foundation Company a hundred thousand dollars higher, and a third bid of eighteen million dollars. That meant a revised budget of thirteen and one-half million including design. Had they come in any higher it would have killed the project. I knew the government would not go over thirteen and one-half million.

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# Beyond Habitat

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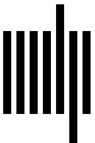
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