

Washington, D.C.: An abortive attempt

My flirtation with the U.S. government goes back to the days when Expo was still operating.

I was invited to give a talk about industrialized housing in Washington. Wolf Von Eckardt, the architectural critic of the *Washington Post*, was to be a speaker too. He had earlier interviewed me in Montreal and written about Habitat. He suggested that I meet Robert Weaver, the Secretary of the Department of Housing and Urban Development (HUD) while I was in Washington and told me he had spoken to Under-Secretary Robert C. Wood, who had expressed interest in meeting me. So when I went to give my lecture, a meeting was arranged with Weaver, Wood, Commissioner of the FHA, Philip N. Brownstein, and Mr. Weaver's executive assistant. We met in Weaver's office and I showed them drawings and photographs of Habitat and some of the studies I had been doing since then. The next day, at Weaver's suggestion, I had a meeting with about twenty high-ranking FHA and HUD officials.

One of the people at that meeting was Jim Simpson, who was head of the technical research department. After my presentation, he told me he felt my work was closely related technically to the work of Ed Rice and his firm Conrad Engineers, who had been doing modular housing construction studies and precast work using Chemstress concrete and also had been doing the Instant Rehab project for HUD. In this project bathrooms and kitchens were prefabricated and dropped into the core of old tenement housing in New York in a forty-eight-hour renovation. He felt that we would make a good team and that we ought to get together.

Right then and there, he got Ed Rice on the phone, told him how he felt about it, and suggested that Rice and I meet as soon as possible. The following week I was in San Francisco. I flew down to Los Angeles where Rice lives and met him and his staff. This was the beginning of an important relationship. They are the structural engineers for most of my present work.

Rice was in the midst of building a precast apartment building of three-dimensional modular box units using two-inch walls. It was a conventional design, a regular twenty-four-unit six-storey apartment building, built with box modules. I was amazed to find out during our first phone conversation that Rice knew everything about what we were doing. He knew about the size of our units, our bathrooms, the thickness of our walls, and some of our problems; obviously, he had been keeping in very close touch with our progress. Instant Rehab had just been completed at that time.

A few weeks later I was invited to make a presentation to the President's science and technology advisory committee in the White House annex. Shortly thereafter, Ed Rice and I were called to Washington and told that HUD would like us to join forces on a specific project. We were to make a study for public housing in Washington, D.C. using Habitat environmental design with Conrad engineering technology. The District of Columbia housing agency would be the immediate client. Our task would be to select a suitable demonstration site, make cost studies and designs to prove feasibility, and then build a public housing project.

I went ahead with a detailed design study for each of four sites we thought most promising, including development of a system incorporating all the Habitat lessons in an attempt to reduce costs. We still had no contract, but we were regularly told that it would be signed "next week", or "very soon." I was encouraged to think that this was just a technicality, and was advised not to worry about it. Four months and thirty thousand dollars later some major changes took place in HUD and suddenly I was told to stop work. The project was abandoned, the contract would not be signed, no funds would be forthcoming. I had assumed that, as in Canada, if the government told you to go ahead a contract was a technicality. In the U.S. if you've done work without a contract, it's considered to be "promotion" and you just don't get paid.

The studies had included a detailed design for one particular site in the suburb of Anacostia, and one at Fort Lincoln. The density would have been about double that of Habitat Phase 1. Yet there were economic advantages to restricting the building to six storeys with the concrete box system.

The problem was to establish such a density with a box system without going over ten storeys and keeping most of it within five or six floors. Very encouragingly, we achieved a density of about forty houses per acre, gross. These were large houses, so that we are talking about a population density in excess of two hundred people per acre, gross.

This was our first opportunity to change and modify the system after our Habitat post-mortems. First, the mechanical system was greatly simplified. Instead of running services through the pedestrian streets, we took them directly to the ground in vertical shafts. The structural system was also simplified by eliminating the street as a load-bearing element and introducing vertical

supports along the inclined plane to reduce the cantilevering or arch action. We reduced the variations in connections and openings in the boxes. Conrad Engineers planned for the use of expanding concrete that pre-stresses the casting chemically and allows a reduction in the weight of concrete in each unit.

In this phase, I still stuck to the sixteen-foot wide module, but I changed the entire module in such a way that most of the partitions were on a module line rather than at random as at Habitat. That meant it would be possible to pour each of the partitions in concrete with the rest of the box when it was being poured, at a cost substantially less than a partition built with studs and panelboard. We also planned to cast the electrical wiring in conduits in the concrete to eliminate the mechanical sub-floor. The theoretical costing at the time came in around sixteen dollars a square foot about one-seventh the square foot cost of Habitat Phase 1. This first post-Habitat application could be described as Habitat without major geometrical changes but with all the technical lessons applied.

A few months later, while I was on a trip to Puerto Rico I heard that I was urgently needed in Washington the following day. I called Ed Rice and found out that the Fort Lincoln project, one of the sites we had made proposals for, had progressed. Architects and planners had been commissioned to do a master plan for it. We were not being considered for the whole Fort Lincoln site, but HUD convinced the land agency that a little corner of the site ought to be appropriated for technological experimentation, for which HUD would make some funds available.

The entire "who's who" of building technology was invited to Washington that day: Neal Mitchell from Cambridge, Mass. who presented his systems, various universities that had done system studies, Carl Koch and Sepp Firnkass from Boston, the whole gamut of innovators in housing. Rice and I presented the scheme we had already done for Washington. A few days later, the decision was made to use this corner of the site which could accommodate about four hundred units, split it in three, and invite Harry Weese, Paul Rudolph, and myself to do a third each.

I was pleased with the appointment, but extremely disappointed with the scope of the project. One of the things I had said in my initial presentation was that any project of less than four hundred units ought not to be done unless very substantial R&D funds were available. As it was set up, the parameters of the project guaranteed failure from an accounting standpoint. It was so small that you just couldn't justify any tooling-up costs. You couldn't even afford to design it if you were on a regular fee. The feasibility study funds amounted to twenty-two thousand dollars for each of us, and I had already spent thirty thousand dollars in the initial study and still had to fund the engineering studies. But, after a lot of soul-searching, I decided to accept the invitation and proceed with the work.

Working with housing authorities on the development of the project was in a sense a new experience. Unlike Habitat where we were dealing with exhibition officials, here we were dealing with professional “housers.” These individuals had been dealing for many years with a particular sector of the housing market, that is, low and moderate income housing financed or insured under the various FHA programs. For that type of project, over the years, a particular procedural formula had evolved, a particular housing vocabulary you could call it. Naturally then, in the many meetings we had with various individuals within HUD, a profound confrontation took place between our proposals which challenged established practice and their comfort in doing things in the familiar way.

There was a kind of subtle undertone in all the meetings. In the pre-Fort Lincoln days, when we were dealing strictly with public housing authorities, I always got the unspoken message that the project ought not to look too good, it ought not to appear luxurious. A garden or pedestrian walkway or anything like that made everybody nervous. A young FHA architect in one of the meetings said, “It just looks too good. It’s not a matter of the cost even, it’s just that it’s going to be a problem.” The other attitude was: “We didn’t ask you to improve housing standards, we want you to cut costs.” But, on the Fort Lincoln project there was the conscious effort to do something good. The only difficulty was that it had to be done for the same cost as run-of-the-mill public housing, and be better, and all this as a one-shot hundred-and-twenty-unit project.

After several months of painstaking effort, the contractors, George Fuller Construction Company and Stressed Structures Inc., came in with a guaranteed bid for \$17.44 a square foot, approximately ten per cent above the cost of the standard low income projects, and that was based on the production of a hundred and twenty units only. The contractors said they would go down to about fifteen dollars a square foot if a thousand units were ordered.

There were in addition, serious problems with the District of Columbia building code. For example, after working for a long time to get all the south windows under cantilevers so they would be shaded, we discovered that according to the code windows under a cantilever were not permissible. Neither did the code permit open walkways or open stairs.

To demonstrate the shortcomings of the code, I brought down the working drawings of Habitat and had a meeting with the code officials in which we demonstrated that each and every one of the code restrictions that were problematic at Fort Lincoln would have made Habitat impossible too. And yet I was there because of Habitat! I made a strong case that the code was restrictive and illogical, and a special task force was formed with representatives of FHA and HUD and the District of Columbia building department. Eventually they recommended that the code be changed. Since it would take years to change the code, we suggested it ought to be treated as a prototype. But there was resistance to making a special category for experimental construction that

could circumvent the code without creating a precedent, which was the way we did it in Habitat.

We were pressed to continue our efforts to bring the cost down, but without budging on the size of the project. The choice became one of reducing the standards, like eliminating the terraces, omitting the covered parking, etc. I wanted very badly, to build the project but there comes the moment of truth: build at what 'price'? at what compromise? and compromise for what reason?

The issues became clear and that course of action unacceptable. Since we were only ten per cent over budget, with an experimental project of a hundred and twenty units and a guaranteed bid, it seemed only logical that HUD should go ahead. It would also have been logical to make some R&D money available to cover that ten per cent. After all, the project was too small to justify tooling up or design investment by the participating industries, and once in full production it would obviously be within HUD's cost parameters. I felt that \$17.44 was an excellent price for what we were offering. I finally stated that we wouldn't change the basic scheme: wouldn't change the design, wouldn't take the gardens out, wouldn't take the covered parking out. I took a kind of "take it or leave it" attitude. In the same meeting Paul Rudolph said that with more time he could cut his costs down. His costs were about the same as ours. Harry Weese's project, conventional townhouses of lower density, using panel construction, had costs comparable to HUD's standards.

A little while later I read in the papers that my project was abandoned. By that time we had spent twenty-eight thousand dollars in addition to the initial thirty thousand dollars, all for a fee of twenty-two thousand dollars. I wrote Tom Appleby, the head of the Redevelopment Land Agency, that I felt the RLA ought to be honest and state publicly that the project was feasible had they been prepared to build a thousand units, rather than say simply that it was not feasible on the basis of cost. My letter was never answered.

At the conclusion of the Fort Lincoln contract we submitted a comprehensive report in which we assessed in detail the prerequisites for making prototype projects successful. One point was that either there should be a minimum of a thousand units (ideally five thousand) to justify the investment on the part of contractors, or it should be done on a small scale with R&D money to make up the difference. Another point: don't try to change the whole building code for one project. Take it out of the code by saying that it's research, to be handled separately without setting precedents. A third point: tell the participants from the beginning exactly what they have to provide by way of physical and environmental requirements, and exactly what costs they are aiming for.

A pleasant footnote to the Fort Lincoln story can be found in the terms of reference for Operation Breakthrough, announced by HUD in mid-1969. Breakthrough was HUD's (and Romney's) first large-scale thrust into industrialized housing and it was interesting to see that almost every one of our

recommendations in the final Fort Lincoln report was adopted. The first phase was to be done on a cost-plus R&D basis in which a limited size prototype would be constructed. Ultimately, full production of five thousand units would take place for each of the systems awarded a contract. The Breakthrough call for proposals also went to some length to describe the quality of environment or standards expected in the dwelling units. It unfortunately did not extend these standards to the overall community. Nonetheless, even in the area of handling codes and unions the Breakthrough project seemed to have gained much from the Fort Lincoln experience.

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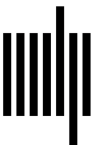
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