Conversion of Industrial Buildings to Academic Use at MIT

WD: So today is April 20th, right?
SI: Steve Immerman and Bill Dickson. And we’re going to talk about one-time events?
WD: Yes. I have three or four one-time events.
SI: So what was the first one you want to talk about?
WD: Well, I’ll go chronologically. The first one actually was the first parking garage, the so-called steel parking garage, East Garage, which was built in 1960. It actually was one of the first projects I worked on when I came back to the Institute. And as most of you will recall, it’s now gone since the end of construction of the Stata Building, but it was the first parking garage built at MIT, and it was somewhat different than what you normally think of a garage in that it was -- the columns were all steel and façade, what façade there was on it was aluminum in order to reduce the maintenance of aluminum grills. And that worked out pretty good. The steel columns, which were every nine feet or so on center, was more of a problem in that the first set of columns, which were put up when it was built, the paint started peeling very shortly. And it’s because they weren’t prepared correctly in the first place. And so they were all scraped and sandblasted. And bridge paint was put on, which worked totemic. And it worked quite well over the life of the garage. The ironic thing is that the repainting -- and I would guess it was probably three years or so after the garage was built -- the preparation on the painting actually cost half as much as the garage did while it was built.

And I’ll get to the unusual aspect of what I wanted to talk about. But just for sake of thoroughness, the garage was designed by Parking Development Corporation who did a lot of parking lots in Boston. And their architect was Carlton Goff, who in full-time employment was actually an architect at the Mass. General Hospital. And the associate architect was Marvin Goody. Most of our dealings were with Carlton Goff.
The garage cost $760,000 and originally was striped to park 420 cars. So a little division will tell you that it was built for about $1800 a car, which is quite different than when you build a garage today. And it was built -- its deepest part was built about a half a level below grade so as to stay out of the water. And the foundations, which is now the unusual part, were pressure-injected footings, so called Frankie piles at the time because Frankie had introduced the pressure-injected footings into the New England area. As a matter of fact, the first or one of the first jobs done was the DuPont Athletic Center, which Frankie also drove footings for.

The pressure-injected footing is you have a tube that you sink into the ground. And these are relatively shallow. They’re basically based on the pressure on top of the sand layer, which overlies the clay. And there’s a machine which does all the work, including drop a hammer with 140,000 pounds of energy. And you fill the tube when it’s empty with concrete and drop the hammer. And the pressure makes a bulb underneath the tube.

SI: Is it dry concrete or wet?
WD: Relatively dry.
SI: Right.
WD: And it makes a bulb so that the area ends up being quite a bit more than the tube itself.
SI: So there’s enough resistant from the sand layer to let the bulb get formed with the pressure down the --
WD: Yes. I mean after borings and everything else, they determined the sand layer was where -- not only where it was but how thick it was. And the bulb starts forming basically at the top of the sand layer. And it bulbs out into the sand layer and compresses the sand. So this machine was quite a magical thing to watch.

And as a matter of fact, here we come to the unusual aspect. I was in fact watching it one day when they drilled. And then they started the process of putting a slug of dry concrete in and then dropping the hammer. And this machine, which was a mammoth thing, you can imagine to drop 140,000 foot-pounds of energy, literally leaped off the ground. And they did it two or three times. And each time the machine sort of went up in the air a few inches. And so the prudence would say you
stop and see why the concrete slug wasn’t going out into the sand layer. And so they stopped and excavated. And it wasn’t too deep, the excavation, when they found giant pieces of granite. And this was the old seawall.

SI: Oh, in Cambridge?

WD: Before the Charles River had its entrapment with the walls that were built in the early 1900s or so.

SI: Wow.

WD: This was where the tidal floods ended. And so that it was a seawall, and it happened to be almost right where Main Street is, on the southern side of Main Street.

SI: And it ran which direction?

WD: And it ran parallel with Main Street so that they had to do a fair amount of excavation in order to remove these granite pieces. Obviously many of them had been removed previously, but nobody bothered to take out the very bottommost pieces of the seawall.

SI: Wow.

WD: And so they actually got the pieces out eventually and continued with the driving. This didn’t delay the project much.

SI: But didn’t they have to sheet pile to keep the water back or was it below the line?

WD: No, it was above the water table.

SI: OK.

WD: They might have done some local pumping there, but they never did have to sheet pile in that area. So it was a very interesting thing to see this machine practically leap off the ground. The building was completed in relatively short time. And there was no pre-stressing or post-tensioning. The floor slabs were formed below and just concrete, reinforced concrete poured. And that provided some problems over the years because of cracking of the slabs, etc. But a generally successful project with a little idiosyncrasy.

SI: It lasted a long time?

WD: Yes. And with work on the floors, it could have lasted a lot longer, but it would have been fairly expensive. The next one we’ll talk about is at Eastgate. Eastgate is a residential tower behind the Sloan Building. And I think E55, if I’m not mistaken.
And it was 30 stories in height designed by Eduardo Catalano, founder on piles, which were about 85 feet long. It’s the layer underlying the Boston Blue Clay. At that end of the campus is the shallowest. So that floor was somewhat below grade but partially. And it provided for mechanical space and office for the facilities and the bottom terminus of the three elevators that served the building.

The second floor was a childcare center. And that occupied much of the second floor, and as well as the attached to it or adjacent to it there was an outdoor play area. And I believe that probably still exists today. And then there were 27 to 28 floors of apartments in a fairly regular pattern, one and two bedrooms. And the top floor was a communal floor with a community space that the residents could use for parties and get-togethers. And I think the laundry was probably on the top floor also.

And this building because of its regularity in plan was erected fairly quickly. I mean there was a schedule that said you were able to complete two or three floors every two weeks or something. And they held pretty much to that. Nothing unusual in what I’ve said so far.

SI: No.

WD: But when the building was basically complete, there was a need to get some material on the top floor of the building. And so we had to -- we, the contractor hired a crane service. And it was a regular mobile crane with a very lengthy boom, as you might imagine, to reach 30 floors. Thirty floors, remember because it’s an apartment building, the floor heights were only about eight feet. So it probably wasn’t any taller than the 20 floors over the Green Building.

SI: Yeah.

WD: But nevertheless this crane had a long boom, which was able to reach the top of the building. And I was sitting one day in Don Whiston’s office who was the general superintendent of Plant, which faced to the east. And it was around noontime and you could see the crane over the smaller outbuildings that were in between. There’s the [inaudible], the Ford Building in Eastgate. But you could clearly see the boom, and you could see that it was nearly straight up. And when you looked one minute, you saw the boom straight up, and when you looked back the next minute, you saw
nothing. And the boom actually collapsed. It bent backwards over the cab. And so that you know there’s struts that hold the bottom part of the boom, and they crippled or bent. And the boom went right back in a gust of wind, which wasn’t too severe. And went diagonally across the Sloan parking lot. And it took out several cars.

SI: Wow.

WD: And the tip of it reached the sidewalk on Main Street, and just reached it so much so that the very tip slipped the chain link fence as it fell to the ground.

SI: Gees.

WD: And naturally I went down there to see how they could lower the crane so fast and found that it had collapsed. Fortunately, no one was injured except for the cars. And as it collapsed naturally it hits one first and then one further way, one further away. And the first one it hit was a Volkswagen Beetle, a bug. And there was no question about the tightness of the Volkswagen bug because it practically just exploded. There were pieces of that Volkswagen all over the place. And it was no more.

The other thing that was ironic is that the architect’s representative on the job, a guy named E. Crowley Cooper, was walking up Main Street at the time. And when the crane came down and slit the fence, he was about three feet away walking up the Main Street sidewalk. So needless to say, after a quick underwear check [general laughter] he went to the job right away. I think in a point of interest that building was built by the Vappi Company. And I believe Dick Finn was the project manager for Vappi --

SI: Oh, no kidding.

WD: -- at the time. As you may recall, some of you, Dick Finn later came to work in the facilities area.

SI: Was he the same class as you?

WD: I think he was either the year after. I’m not sure. He wasn’t in my class. He was either the year before or the year after. The third project that I wanted to speak of was the Carr Tennis Courts. There was a fellow named Jasper Carr who in the worst way wanted to see indoor tennis at MIT. And he offered to pay for some of the money to do so. And we looked at several alternatives, a couple of which were down where Simplex was or where University Park is now, and building a, you know, a
lightweight structure. Not an air supported structure but a lightweight metal building much like you saw a lot of these tennis clubs come along that used. But it was always too expensive. And we didn’t feel that we wanted to sink a lot of fund into this. And so it got stalled for years.

Finally someone suggested that we build an air-inflated structure, which was considerably cheaper, and build it by the tennis courts. And this, I’m not sure, I’m not sure whether we built it over some existing courts or we built it next door and added courts. My feeling is that we may have built it out of some -- over some existing outdoor courts. So we worked with Mr. Bird who was the head of Bird Air, I think also an alumnus of MIT. And Bird Air had developed or was at the forefront of the development of air-supported structures.

And after some time we had a design. It was not a cable stage structure like the later ones. It was like a balloon. It was completely air supported. I think we put emergency power at Burton House in case we lost power so it wouldn’t collapse. And we constructed it. And I know that George West, a fellow named George West had a lot to do with it. And we probably had it up in the middle of a week when a hurricane was predicted. And Boston indeed was hit with a hurricane, not of substantial force, but relatively high winds. And that probably occurred like on a Friday or so.

In any event, I was going on vacation. And on the Saturday one of my sons was in a Championship Little League game. So my wife and other two children went to Lake Winnepasaukee, and I stayed for the game and then drove in to go to New Hampshire through Cambridge to see how the structure had fared. When you worry about something collapsing like an air-inflated structure, all you need is a nice hurricane in the first days of its in place. So I walked around it. It looked good. It was still up. George and Shirley West, his wife, were there. And after we got through a trip around it and looking at it and seeing nothing out of place, Shirley said, “Well, I guess it will be all right after all.” And I said, “Yes, it probably will, but I know it’s going to be a pain in the ass.” [General laughter] The minute I said “ass,” it split right across the middle. It was timed so that I’m not even sure I finished the word. And it split right across the middle. And of course we had all been concerned that if
it sprung a leak how long it would take to come down, and if anyone was playing in it, could they get out, etc. And we were assured it would take, you know, 15 or 20 minutes to deflate. But it never was anticipated that it would split right across its entire middle. And it took about ten seconds for it all to be on the ground.

It turned out after some wind tunnel testing that Bird did, that there was a revolving door in the side of the structure, and it built up stress concentration. And that’s where the split started at the edge of the door. So as it was repaired or renewed or what, you’ll notice there are no doors on the sides of the structure, only at the ends. I think that was the first and only catastrophic collapse. There have been others that were of the slower variety.

The second generation structures were all cable stayed, so that a lot of the stress was carried through the cables and not through the skin of the balloon. Nevertheless on big snow buildups, etc., if the snow is wet and heavy and is not removed from the top, you can start to collapse the building. I’m not sure that didn’t happen partially this last winter. But I’m not sure of that. I think in a chat with Paul Gray last week, he seemed to think that it did.

Anyway, I don’t know what version we’re in now. They tend to last eight or nine years, and then you have to put in a new version. It’s still not the thing to have on a college campus for mainstream athletic purposes. And it also then should be replaced by other indoor structures or it should be replaced with a hard surface structure. That was a dynamic event however. There was no architect, I believe, on that job. Bird Air was basically the designer of the dome, and MIT did the site work.

SI: You couldn’t get a permit today if you wanted to build a new one, right?
WD: I’m not sure. Why not?
SI: I thought that it -- you know how it was kind of structured.
WD: No. I don’t know that.
SI: Could be mythology.
WD: Yeah. So those were the three very unusual things that came to mind when I was talking about some unusual occurrences that have taken place.
SI: Great story.
WD: Let’s see. We shouldn’t waste time. There’s got to be something else we should talk about. Do you have any particular questions about anything, Steve?

SI: Did you on one of the past dates talk about the Kresge roof?

WD: Yes.

SI: OK. So you had covered it?

WD: I spent a considerable amount of time with Vicky and someone else at the Kresge roof.

SI: Did you talk about the other aspects of the subsurface over near the alumni pool? Because it’s the same issue of the sort of the edge of where the waterfront was?

WD: No. We talked about the issues of heavy peat layers under the Whitaker Building. But I haven’t said anything about the alumni pool. What do you think the question is there, Steve?

SI: Well, there was a lot of aquastatic pressure on the bituminous exterior.

WD: Right.

SI: And it was pushing it into the inside of the pool. And so there was concern about how they were going to fix it. But the notion was that that area was extremely well documented, maybe by Aldridge.

WD: Oh, I think so. I think that was -- frankly, I think that was just groundwater. I mean the pool was quite a bit into the ground. And the groundwater table was about six or seven feet below ground. And of course you could elevate it in heavy weather. But I know what you mean. I know that the bituminous coating of the outside in some places had leaked through the pool. But remember, the pool was built in 1938, I believe.

SI: Yeah, it was in --

WD: So it had been a long time coming.

SI: They said it was an important building. One of the first modernist buildings on a college campus in the United States.

WD: It was. I didn’t realize that because I’m no architect, as you well know. But when we talked about taking it down if we built another pool, we ran into all sorts of problems, particularly with the architects on campus and architects outside of the area who said this was a very important building in the modernist movement in architecture.
SI: Ed Anderson, right?
WD: Larry Anderson of Anderson, Beckwith actually designed the building.
SI: Was he on our faculty?
WD: Yeah, he was once Dean of the School of Architecture.
SI: Oh.
WD: Both Anderson and Beckwith were on the faculty of MIT. So what I might ask you, what did they end up doing with the pool?
SI: They renovated it. Got a new curtain wall. And I’m not sure how they dealt with the exterior below grade, but they renovated it and they were going to put it back in use and keep it as a pool.
WD: Yeah.
SI: And lots of ideas that were generated about what to do with it.
WD: I always thought it would make a -- they ought to fill it in and make an ideal childcare center.
SI: I thought they ought to make it a faculty club, right dead center --
WD: Well, that’s another possibility.
SI: But there’s an awful lot of recreational demand on that side of campus now that they’ve concentrated so many faculty and staff between Stata and Brain and Cognitive.
WD: Yes.
SI: And it turns out to be almost the epicenter of our faculty on the campus.
WD: Are they rebuilding the pool?
SI: I don’t really know whether they’re rebuilding the pool not only but --
WD: They must have.
SI: They must have had to. I know they put a new curtain wall in. It looks great.
WD: Are similar in the architecture?
SI: It is. It looks fabulous. They did it right over the outside of the old one, sort of like an exterior. Beautiful job. And of course they got the Stata recreational center right next to it. So it’s all now an extra recreational space on the campus.
WD: Do they still have squash courts in the --
SI: They took those off.
WD: They’re not there anymore?
SI: Because they didn’t meet the new international dimensions. And they had to -- they have to replace --
WD: They probably needed the space for the Stata building, too?
WD: Well, I think we might talk about the second parking garage since we have a little time that we ought to use. The second parking garage was the West Garage. And it has some idiosyncrasies, although nothing unheard of happened. But the site where the railroad got straight, Vassar Street, is only 90 foot wide instead of the ideal site of 120 feet, which the West Garage was. One hundred and twenty feet gives you four lines of parallel parking on each level. And of course 90 feet does not allow you to do that. You have to get into -- either lose lots and lots of space or get into diagonal parking.

And so the building, we decided to go ahead and build it on the 90-foot width. This one was different. It was reinforced concrete and not steel. It was designed by Goody and Clancy. And much of the time was spent in figuring out an optimal parking pattern on the floors. And you probably know how that came out by having parked there. But there’s lots of -- I mean almost all diagonal parking. And we actually fooled around with shapes of the diagonal or the angles of the diagonals in order to maximize parking. The other thing was because again of the width, we were not able to get an express down-ramp. You recall in the East Garage you came into the building and went up the ramps until you came to a space that was vacant or somewhere where you wanted to park and you took it. But coming out of the building you went down an express circular down-ramp. In Eastgate we had to have cross traffic because we had up-ramps and down-ramps that were in the same location. And so because again of the width, you had to come into the building and sort of drive to the back and up a little, and then drive to the front.

SI: Right.
WD: And up another level. And in the meantime you were crossing down levels. And we feared that that might be the cause of some severe accidents there. But to my knowledge, I can never remember an accident taking place.
SI: I don’t remember one.
WD: I’m sure that I’m wrong. But if there was, there was nothing ever severe that took place. That building -- the thing that came to fore in that building is that the expanded wire mesh that was put before the slabs were poured started telescoping through the bottom of this loop. Well, that’s the wrong word. The floor above.
SI: Right.
WD: And so we worried for a long time that this would lead to some potential problems. And we gave it a lot of thought and consideration. And to my knowledge we never did very much about it. And it never really caused a big problem. I think if you went over there today, you could probably still see some of it, unless it’s been painted over. So that was an unusual garage in that it was many feet wide. It actually may have been 92 feet, 6 inches wide, but it was right around there, you know. The reason being, we couldn’t extend it onto the railroad right of way.
SI: The tight building site all the way down that?
WD: Yes, for anything.
SI: Right.
WD: And there’s a deed. It was for [Sim and Saul?].
SI: Did you in any of the past discussions talk about the pour outside the Hermann Building in the plaza of the student center, that concrete? Do you remember the --
WD: No.
SI: -- trouble we had with the concrete coming apart. And we replaced it all at the Hermann plaza but we just patched it in front of the student center. And there was something unusual and different about that aggregate.
WD: Well, it was just -- it was washed concrete. And the aggregate was exposed. And as you salted and everything else, it eventually cracked up. And that’s why we had to replace the whole terrace down at the Hermanb Building. And I’m not sure there’s any left. Is there at the student center?
SI: Yeah, they continue to patch it, and big pieces. This year very aggressively because in the winter it was really murder on it.
WD: That concrete was a trademark of Catalano because the Hermann Building and the student center were both done by Catalano. And he’s the one that loved that washed concrete.

SI: They came up with a new -- some kind of a new aggregate as you move towards the Zesiger Center and they sealed it. And it had the same appearance, but I know it’s not the same -- the same kind of a thing. It’s a much smaller aggregate and I think it’s made to look like it.

WD: Yes.

SI: So they don’t run into the same problem.

WD: We had steps down the Hermann Building that were made of that same material, and they were ultimately, I know, replaced with concrete steps.

SI: That’s right.

WD: I wanted to put in granite but it was very expensive. So I think that’s probably as far as I’m going to go today.

SI: Okay. That’s great.

WD: Well, I hope it’s of some interest.

SI: This is great.

[End of interview]