

Oral History Interview

with

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By Michael R. Adamson

Adamson: So to provide some context for our discussion, tell me about your background and career and how you ended up at Purdue and then up to the point where you first met Charlie Pankow.

Drnevich: All right. Thank you. I'm Vincent Drnevich. I'm originally from western Pennsylvania area. I did my undergraduate and master's degree work at the University of Notre Dame, which is in South Bend, and that's Charlie Pankow's hometown. So he used to tease me a little bit about that. Of course, he came to Purdue.

I then went off to the University of Michigan, where I got my doctoral degree, and my principal area was in geomechanics, foundation engineering, and material and properties.

I then went to the University of Kentucky, where I was on the faculty there for twenty-four years. At the University of Kentucky I went through the ranks. I was also chairman of the department and acting dean of engineering for a period of a year.

In 1991 I was convinced that I should come to Purdue by Dean Henry Yang, who's another person who knows Charlie exceptionally well. I came here as head of the

School of Civil Engineering and was one of the first persons, a non-Purdue person, to become head of the School of Civil Engineering, in fact, of any engineering department. It is in that context that I first met Charlie and it was about 1991 that I met him, and so my relationship with him starts at that particular point.

Charlie, at that time, already had received an honorary doctorate from Purdue and was a regular member of what is known as the Dean's Visiting Committee. As a department head, my responsibility was to attend those meetings, make presentations before them, and interact with the Visiting Committee in their twice annual visits. So that's my first introduction to Charlie.

I was head of the school for nine years and then in 2000 stepped down as head of the school and maintained a relationship with Charlie throughout that period of time and somewhat afterwards, as well, even though I didn't have an official capacity. He's the type of person that you established a friendship with and that lasted a long time and beyond.

So that's basically the background. I had a chance to visit with him a number of times in the Altadena office, at his home there, and also in San Francisco, and there's a nice story to tell about that whenever you're ready for that.

Adamson: Sure. This one was down my list, but did these visits include visits to Pankow job sites or Pankow buildings?

Drnevich: Yes, it did. That was one of the things that he was very proud of, his facilities. I remember one in particular was the Gateway Center in Los Angeles and a

number of very interesting and innovative type of construction work was done there, and as a consequence, we would go to the sites, go through the buildings, and some of his people would point out to us what the spectacular things are, the innovations that were taking place. So we were in on the ground floor.

We also have here at Purdue a construction engineering and management program, and that program requires the students every summer to have an internship, and Charlie's firm always had a number of Purdue interns on the job, and so it was a chance for us to visit the students while they were doing their internships and very proud of what they were doing and who they were working for. We got a chance to see a number of them. We saw one in downtown Pasadena. It was during the Rose Bowl Parade, the year that Purdue went to the Rose Bowl game [January 1, 2001]. So Charlie's building was under construction there and he had it set up so that it ended as a viewing stand for the parade, because it was right on the main street for the parade. So there were several hundred of us on the bare concrete floors with just temporary tapes between us and the street, but it was an ideal viewing stand for the Rose Bowl Parade. So that was another site that we visited.

We frequently talked about sites and the work that he was doing whenever we got together.

Adamson: Of course, by 1991 his company had gone through a reorganization; it was growing again.

Drnevich: Yes. Yes.

Adamson: So that's a time a lot of the signature buildings that you see around Los Angeles and San Francisco were going up.

Drnevich: The thing that truly impressed me in their annual report, and then I think they had calendars as well, that showed Pankow City, and probably others have referred to that, as well, but it's a collage of all the buildings that he had built and it looks like downtown Los Angeles. It's a very impressive accomplishment to have built those, not only on the West Coast, but in Hawaii and other parts of the country as well, but they have been active in construction.

Adamson: This committee that Charlie was on, that you first met him, can you elaborate on what it did? Was it civil engineering specifically or it is university-wide?

Drnevich: This was intermediate between the two. Back in those days we were known as the Schools of Engineering, and now we've been renamed the College of Engineering, which is more typical of what you would find in other institutions. Then within the College or the Schools of Engineering would individual schools, as opposed to departments. For example, we are the School of Civil Engineering and we retain that name to this date. One of the reasons for being a school is that we're slightly larger than most departments might be in terms of student body, faculty, etc., and we have a lot of research and extension activities that perhaps other institutions don't have. So the word "school" is an appropriate title for this organization, for our structure. There are Schools

of Mechanical, Electrical, Nuclear, Materials Engineering, etc., Biomedical Engineering all exist now on the campus.

Back in those days we had the Schools of Engineering and the dean had what he referred to as a Visiting Committee, and these were people of stature representing all disciplines of engineering. The number I'm going to guess was probably fifteen, eighteen people, who convened twice yearly for a one-day event, and it usually started the night before with a dinner and then the program of activities during the day and then usually a send-off or some other event after that.

And the idea was to have these people who were captains of industry, if you will, advise the dean on where we should be going, whether we're doing the right things or not. Charlie was a very prominent member of that committee.

To give you an example of some of the other captains, if you will, Neil Armstrong was a member of that committee, the president of—I'm not sure he was on there at the same time or not, but the major corporations. Boeing always had somebody prominently on that committee, Silicon Valley people, the Sun Microsystems, Intel, Texas Instruments. President of Texas Instruments is also a Purdue alum. So these are the kinds of people that we're talking about, and it turned out that they had a very strong impact on the direction of Purdue University, Colleges and Schools of Engineering. So they would set the pace and they would also review for the dean certain departments on a rotating basis and they would come in and we'd have to make presentations to them and just kind of lay out what we're doing, where we're going, and they would then report to the dean about that.

One of the ones that I remember especially vividly was the one with—and it was the mid 1990s, when we were doing the question of environmental issues and what is Purdue doing for environmental issues. The dean at that time, Henry Yang, said to me, “Environmental is predominantly in the area of civil engineering, so I want you to take the lead and put together a program for the Visiting Committee, a daylong program.”

So it was my challenge to identify on campus all activities associated with the environment and education and research, bring that together into a program and present that to the Visiting Committee, which we did. And I can remember two things. One of the persons who was very pushy on that, asking the questions, putting me on the spot, was Neil Armstrong himself. So I had to interact with him, and you talk about a giant. The building right behind us, by the way, is the Neil Armstrong Building. If you’re interested, I can take you over there and show you a little bit afterwards. So basically at the end of the day we were impressed and I think they were impressed with the breadth of environmental activities existing on this campus.

And then the one statement that still rings in my ears is that environmental issues are so important that every student in engineering, irrespective of their discipline, should have a course and exposure to environmental issues, and that was completely foreign to our curricula. I think many of the programs have moved in that direction since that statement and we’ve gone much further into that now and we’re becoming much more of a green campus in environmental issues.

Well, shortly after that, we created the Environmental Science and Engineering Institute, where we partnered with the Schools of Science and created this institute for addressing issues associated with the environment. So we’re continuing in that process.

ESEI no longer exists, but it's been replaced by a Division of Environmental Sciences and Engineering. So it's fallout from that. But that's the kind of impact that that committee had on Purdue University, and it was more than just engineering because it carried through in the process.

Adamson: Do you have an idea or do you know from what period of time Charlie served on this committee?

Drnevich: I think he was almost on it the whole time I was head of the school. Theoretically you had terms on it, okay, and that was so if the dean didn't like what you were doing, you could get shifted off. But I think Charlie was on it for the full period. I could research that and get to you the actual dates of his being on that committee. So it was the Engineering Visiting Committee.

Adamson: Many of the people I've interviewed with Pankow point to the efficiency of their buildings. I'm wondering if there's an interface between the efficiency in their buildings and this environmental idea.

Drnevich: Well, Charlie was always strongly in favor of that and was always a step ahead of most everybody else in the industry. His pioneering efforts on the idea of design/build has had a profound impact on our program; I mean very profound. Very quickly on, he would present this information and talk about this whenever he had a chance. I mean, he was about the design/build, and he would query me on how we're

teaching our courses and how we're preparing students. He was adamant that students had to have a strong fundamental background in engineering, so they had to know the structures and the materials and the transportation and other things. He says, "I like these people because they understand how structures behave." He said, "We can teach them how to do the management and construction processes and stuff like that, but we want fundamental understanding."

But then getting back to the impact that he had, he is undoubtedly one of the world's pioneers in the design/build process. He would just drill that into me and then show me time after time when I visited with him, or he was here, projects that he had done this way. I guess that 95-percent-plus of their business was design/build and he used to pride himself that 99 percent of his projects came in on time and under budget or at budget. That was impressive stuff.

Also impressive to me was the fact that while he was alive, there were very few litigation issues associated with the work that he had done. Today, and in the last ten or fifteen years, one of the first persons on the jobs are the attorneys looking for litigation. And there are a number of things that I learned about this, but Charlie so impressed me, and not to get away from the story, about this, is that I tried to, as school head, have our senior design process modeled after the way Charlie's firm does things. The people who were teaching at the time were not that interested in doing it because they've always done it a different way. So when I stepped down as the school head in 2000, I went on sabbatical for six months and I came back about this time of year, and the department head said to me, "Guess whose teaching senior design next spring?" [laughs] So the answer was me.

So I started teaching it. I've been teaching it every spring since then, so this coming spring will be my ninth year of teaching that. The course is modeled after—we do it strictly design/build and we model it after the way Pankow does their work with their clients. We've had Bob Law come out to talk to the class and share with them the way things are done at Pankow. I learned a lot from his presentation. I've taken some of our project final results and shared them with Charlie and Bob and others.

Perhaps one of the proudest moments I had was I took a project out to show them, and Charlie looks at it and he says, "You know, this is about what we do." [laughs] That was a very strong vindication that at least we were doing something right in the process.

Adamson: That's great.

Drnevich: So what we do in our design process is to give the students a request for proposals and have them generate a design, all aspects of the design, site selection, orientation, utilities, the facility, whatever it is, a building, bridge, what have you, and we do this in a design/build mode where they do all the cost estimating, scheduling. We even have them turn in weekly timesheets and give us an invoice for their services at the end of the semester. So it's a very realistic process and they make presentations of this to the clients, and the clients are not only us faculty and any students who want to come, but we have people from the community come in, the mayor and people from city council, the city engineer, people who maybe have some interest in this. So we have a good variety of people involved in the classroom when these students are making their final presentations and they're very well done. So the students, when they leave this program

with that course, they have a very strong understanding of what life is like in the practice of engineering, the Pankow way.

Adamson: That's great.

Drnevich: We've written this course up and we've published several papers on this course in *American Society for Engineering Education*. So the idea is to share this with others, and most everyone who sees the course says, "Wow, we'd really like to do some," and there are programs now that are emulating the program that we have here in that course.

Adamson: That would be great to get those references and have a look.

Drnevich: Okay, I can give those to you.

Adamson: I think what you've just said answers most of my follow-up question, which is what, from your perspective, distinguishes the Pankow firm from other civil engineering firms? Anything more to add to what you've just said?

Drnevich: Yes, there is, and it's a very important issue and I don't know how much of this you already know, but one of the things that Bob Law said when he was here that had a very strong impact on me about the Pankow way is that when they put forward a proposal to an owner and they and the owner agree to do the project for a certain amount

of money over a project period of such and such, they then establish a level of trust with the owner that is just unheard of. The level of trust that they do is they sit down with the owner and say, "These are our financial calculations for your project." Most other firms will hold those very close to the vest, with the idea that they're not going to show how much profit they expect to make on a job, and, according to Bob, Pankow does this. I think it establishes a trust between them and the owner which far transcends anything that I've seen from any company elsewhere. I think that that's a phenomenal relationship that they've established. It's probably one of the reasons that the litigation issues are so small associated with Pankow.

I do know that they were burned a few times on this kind of thing. I don't have any of the details, but basically there were cases where they did establish relationships with firms and these might have been owners that have been a conglomerate of people and they were just interested in getting the cheapest price possible and were kind of using that information in an inappropriate way to try to get the prices changed or what have you. But by and large, I think the thing that Charlie did, and it's something that's so much missing in today's world, is that of trust.

I know when 9/11 came by, the biggest tragedy, in addition to the lives, was the loss of trust that exists in our country and we'll never recapture the sense of trust. A handshake, a word, it doesn't mean what it did at one time before. But more than any other firm I've ever experienced, Pankow had the ability to establish trust with a client and work as a true team.

I know when I'm teaching the course, and I bring a lot of people from industry in, and some of them will say, "No, you can't do that." And I say, "Yes, you can. The fact is that I know somebody who's done it and done it very successfully." So, very good.

Let me just add, one additional thing on that. In establishing a relationship with an owner, one of the drawbacks or potential drawbacks of the design/build process is that there is no independent oversight or checks and balances, as it's called, and that's not really true. But there is a tendency to believe that you can abuse the process and the owner doesn't have independent checks on this. There are ways of having some independent checks, but then the point of the Pankow organization is that they're so strong technically and so ethical in the work that they do, that that's not a problem. But that's not true of many, many firms in the country.

In fact, particularly if they're doing work in the other contracting method, which is called the design/bid/build process, the owner goes out to an architectural engineering firm, gets a bid package for the facility, and then puts that package out for bid on the market. The world is so competitive that these people will look for and try to anticipate where the bid package is deficient in terms of describing things that might exist in the site, and then they will load their bids in such a way that they can get a low bid, but knowing full well that there are going to be some extras associated with—particularly excavation and that nature—that their prices, unit prices, for that will be very high. So the bid comes in low, but when they execute the project, there will be change orders and other kinds of things that have to take place such that the cost of the project will escalate and the contractor will reap additional benefits from his work.

This Armstrong Building right here is a case in point; the little-known story about the contractor pouring one of the floors one inch too thin and it was caught. And so that was a very sore issue. It slowed the project down for several months and they had to go back and reinforce the structural system so the floors would be adequate. It was a cause for litigation and change orders and extra costs and stuff like that. It was just a very difficult situation.

Adamson: Your comments bring to mind two points that other interviewees have touched on, and one is your point about independent oversight is something that construction managers use, and the Pankow people I've talked to, there's design/build on this side and construction management is a long word, but it's a four-letter word to design/build.

Drnevich: Right, right. Right.

Adamson: The other thing is that there's people out there who—my question about why the acceptance of design/build was such an arduous, slow process is that people out there saying they were using design/build weren't actually design builders.

Drnevich: No. No. Exactly. I mean, we'll have the State Department of Transportation people come in and brag about they're doing design/build and it's not design/build at all. It's design/bid/build with a slight twist to it. Basically what they've done is in the build portion of it they will choose a contractor as opposed to putting it out for bid, so it's not a

design/build process in the true sense of the word. A lot of that is associated with, particularly for federal and state-funded projects, those projects by law, in many cases, to protect the public, have to be bid, and as a consequence, what they call design/build is trying to skirt the law in a legal fashion, if you will, but that does constrain a lot of things. Everything on campus here has to be design/bid/build.

However, we did build a building called the Bowen Lab, which I hope we can get to show you, because Charlie had a role to play in that as well. That was done on property owned by the Purdue Research Foundation, which is a private organization, and hence we could do a design/build. Charlie and his staff kind of looked over our shoulders. In fact, I went to ask Charlie as we were engaged in doing this, and we had an alum who was a very reputable person and took the lead in doing this design/build, but I wanted assurance that we were doing it right. So I went to Charlie and asked him to review what we had done here, and I remember him telling me, “Go with it.” In fact, it was at the Rose Bowl celebration at his house. He had a luncheon for us during the Rose Bowl in 2000 [for the January 1, 2001 game] and he caught me on the corner and he says, “Vince, go with Harold Force.” He says, “He’s a good man. He’s doing it right.”

Charlie’s take on that was correct, because the facility is phenomenal, and we did it in a very short period of time relative to what the university would take to do things. The maximum cost was not to exceed \$11 million, and we came in at \$9.9 million. So it was a very good experience for us. So it was another point that I reinforced my notion that design/build is the way to go for a lot of construction, perhaps not all, but for a lot.

By the way, in that senior design class that I talked about, we designed that building twice at two different locations prior, once prior to its construction and then

secondly at another location while it was being constructed. We, quote, designed it in the senior design class here at Purdue. So good fun for us.

Adamson: My understanding of the construction, engineering, and management program is that a graduate of that program would be able to go into a company at a level above the field engineer, project engineer level. But Pankow's getting away from this a little bit, but the traditional path was no matter what you started—

Drnevich: You start in the field.

Adamson: —you started in the field.

Drnevich: That's good. But the construction engineering management students typically already have four summers in the field. It turns out that a lot of the internship kinds of things that you would have on a university campus are gofer positions or rod-holders or rebar counters and stuff like that. It turns out that with the oversight that we apply, and the nature of the relationship between the people providing the internships and Purdue University, the students really have very meaningful work to do, and as a consequence, have significant responsibility. It's really part of their educational process and come back very pumped up about their experiences. I think that's one of the reasons they're able to go in at a more than get-down-in-the-trenches kind of thing. But some of them do and some of them just love to be out in the field and they don't want to be brought into the office yet.

Adamson: Tom Verti told me that the day he came into the office he felt it was a demotion.

Drnevich: Yes. I can agree with that, yes. [laughs]

Adamson: Bob Law said that he's been involved in that program as well. I'm wondering if, he didn't mention this, but have any of the graduates at the CEM program gone to Pankow?

Drnevich: I believe so. I think there's a person by the name of [Aaron] Purdue, if I'm not mistaken, who went with him. There were several others that I visited out on sites that I know went with Pankow afterwards. I can't remember their names right now, but that has been a good area for them to recruit from. People have generally gone and stayed with Pankow quite long, as well.

Adamson: Your mention of the trust brings up a question I was going to save for later, but Tom Verti, now president, mentioned in a video that's used to train people in the culture of Pankow, that he talked about the culture of respect in the firm that Charlie instilled, and I guess part of that is the trust you mentioned.

Drnevich: Yes, I've seen that video, by the way. They brought it and played it for a program here after Charlie's passing, and I asked the Pankow family if I could get a copy

of it. So I have a copy of it and I have loaded it to the web and it's available for our students see in the senior design course, just to set the tone, if you will, of where they can go.

Adamson: That's the only time I've seen Charlie speak on video or even hear him on tape. My question is, just more broadly, is if you can comment on how Charlie exhibited this respect for others in his external relations and not just within the firm.

Drnevich: Well, with regard to respect, I think that I have to take my own personal experience with that. Charlie had the ability and made me feel as though I was a close personal friend, and that he knew certain things that he wanted us to be doing and he confided in me that that's what he wanted us to be doing. He would ask me, "Are you doing this yet?" And sometimes I could say, "Yes," but other times I'd say, "Not yet." [laughs]

So I established and he established with me a sense of trust that I was willing to go to him and share with him the kinds of things that we were doing, ask his advice on things, and know that his advice would be of great value. That occurred with the dean, or the deans, because he interfaced with lots of deans. With John McLaughlin it was the same story and Harold Michael before me, my predecessor who was head of the school. That kind of relationship was very strong and it was an absolute role model for establishing relationships with people. A very strong, exceptionally well-organized person, very clear thinker, and from that perspective, a unique person.

Adamson: I don't think this is mentioned on that video, but another thing that Bob Law and others have mentioned about Charlie is that he always asked hard questions and unexpected questions.

Drnevich: Yes.

Adamson: And that you could never really prepare for meeting Charlie.

Drnevich: That's correct. That is exactly correct. Yeah.

Adamson: Well, let's go back to the beginning a little bit. Now, you mentioned before we started the interview that Charlie's from South Bend. His father, I'm told, was on the building of Notre Dame Stadium. Did Charlie ever tell you, other than the fact that he wanted to be an engineer, why he attended Purdue versus Notre Dame?

Drnevich: No, I don't think we ever got into that, but I'm sure there's a pretty good story there, but I did not learn that from him.

Adamson: I just thought I'd throw that in. Just generally, beyond the engineering, what did being a Purdue graduate mean to him?

Drnevich: A tremendous amount. I mean, he was always, always touting Purdue University and recalling with fondness his experiences here. He would reflect that he

learned how to think here, and how to work, and how to understanding buildings and structures. So that was a very profound thing for him.

He also had an interesting reflection that he was very fond of telling you about, and that is his relationship with Charlie Ellis. Charles Ellis was the person who was in a consulting firm by the name of Strauss—it was Joseph Strauss Consulting firm.

Actually, Strauss [1870–1938] was a bridge builder out of Cincinnati who built a lot of bascule bridges, and when it came time for them to consider the San Francisco Bay [Golden Gate] Bridge, Joe Strauss, with his political connections and what have you, put forth a design for the San Francisco Bay [Golden Gate] Bridge. It was a hideous bascule-type structure, as ugly as sin, some people would say, okay. But he had such political connections and made such a good offer to the city fathers that they said, “Well, we’ll have you build the bridge, but you have to interact with a panel of experts,” and these were world-class experts on bridge design.

That group of experts said, “You have to have a suspension bridge for that large of a span, and it needs to be designed by somebody who knows about suspension bridges.”

Well, Joe Strauss knew nothing about suspension bridges and he really wasn’t an engineer; he was more of a business person and an entrepreneur. So he looked for a person who could design bridges and he found at the University of Illinois there was Charles Ellis [1876–1949], and Ellis was on the faculty there. So he hired him away from the University of Illinois to design the Golden Gate Bridge. In that day, of course, no computers or anything, it was all done with slide rules and log tables and what have you. Charles Ellis was a perfectionist in that he wanted to have everything right of such a

major structure. So the thing that happened was that he had the designs about 99 percent complete and Joe Strauss said to him, “Charlie, you know, we need to get moving on this and let’s get moving.”

Charlie said, “No, I just want to go with the towers. I just want one more crack at the towers to make sure I’ve got them right.”

So it was about this time of year, near Thanksgiving time, a little after Thanksgiving, and Joe Strauss came to Charlie and he said, “Charlie, you know, you’ve been working on this for a year and a half or two years straight. You need time off with your family, so why don’t you take a couple of weeks off over the holidays.”

So Charlie said, “You know, that’s probably a good idea.”

So he went, and he was gone a couple of days and he got a phone call from Joe Strauss who said, “Charlie, we don’t need you anymore. You’re fired.”

Then Joe Strauss took the drawings and expunged Ellis’ name from the design block on the thing and put his own name in there and submitted the drawings, and the structure was built.

The thing that happened then, it was about the time that the Tacoma Narrows Bridge failed. It was “Galloping Gertie,” it was a suspension bridge, and I think everybody has seen the film of that. They were concerned that the Golden Gate Bridge would behave similarly, and so they went to Strauss and asked him, and he says, “Well, I can’t tell you it’s going to be safe.” So they ended up calling Charlie Ellis.

Ellis at that time, after he was fired, got a job here as a professor at Purdue University. So Charlie was teaching a class, and I think it was in the springtime, and he got this call, “Is the bridge safe for these aerodynamic loads?” So he turned the class into

a workshop and had the students reanalyze the bridge for the wind loads, for the whole semester. At the end of the semester, he wrote back and said, “Yes, it will handle the wind loads.” So he was truly a person who designed the bridge, but never got credit for it.

Then thanks to the work of an investigative reporter for one of the San Francisco newspapers [Ed.: Cone wrote for the *San Francisco Examiner*.] and a grandson of the chief project engineer on the site—Russ Cone was the name of the reporter, they did an investigative study of this, and that’s where all these details came out. Then the American Society of Civil Engineers put together a panel to investigate this, and the panel came to the conclusion that Charles Ellis was the real designer of the Golden Gate Bridge and he should have received credit for it.¹

At that time Purdue University offered to pay for a plaque and installation of that plaque on the bridge acknowledging this fact, but the directors of the bridge, a bridge commission, I guess it is, that controls that, said, “No, what’s there is there.” And so to this day Joe Strauss’ name is on the bridge as the designer of the bridge, but it really was Charles Ellis.

Adamson: Amazing.

Drnevich: Now, the story in connection with Charlie Pankow is a really funny one.

Charlie was in class, Charlie Pankow was in class with Charles Ellis as his instructor, and Charlie tells me that the nickname for Charles Ellis was “Uncle Charlie,” and that was the

¹ For more on this story, see, John van der Zee and Russ Cone, "The Case of the Missing Engineer," *San Francisco Examiner Image*, 31 May 1992; John van der Zee, *The Gate: The True Story of the Design and Construction of the Golden Gate Bridge* (New York: Simon & Schuster, 1986).

way they referred to him when he wasn't in earshot, okay. And he was the most boring lecturer that they had ever encountered. So Charlie Pankow was saying he was sitting in class and Charles Ellis said to him, Professor Ellis said to him, "Charlie, wake up that student in front of you there."

And Charlie Pankow responded with, "You wake him up. You're the one who put him to sleep." [laughs]

Charlie was very fond of telling that story. If you got on to Ellis at all or his time at Purdue, that story would come out as one of his favorite stories to remind him. It took a lot of guts, I guess, back in those days to make a statement like that, but it was really, really true.

Adamson: Charlie first worked for a structural engineer, Barnes in L.A. Coming out of a civil engineering program, would structural engineering be a subset of that?

Drnevich: Yes, yes. We have about eight sub-disciplines within civil engineering, and structures is our largest and most well-known here at Purdue University, but we have environmental, transportation, geotechnical, materials—civil engineering materials—the hydraulics and hydrology, and we're now going into the area—construction is one of them, as well. So we call C-Cons, civil engineering construction students within civil engineering and then we're going into architectural engineering now as a thing that we think is where some of the action is going for the future.

Adamson: Now Charlie worked about a dozen years for Peter Kiewit, and the story, as I've put it together, is that he did buildings within Peter Kiewit, but that the Western Division headed by Ralph Kiewit wasn't keen on Charlie's idea of putting building construction offices in all the Kiewit offices. He liked the Kiewit organization, but he wasn't able to do the buildings he wanted to do, and that's why he—

Drnevich: Went off on his own, yes.

Adamson: I'm just wondering if you can see any parallels, just culturally, between Kiewit and what Charlie brought with him to his company.

Drnevich: Well, Charlie's culture is unique, as far as I know. The Pankow culture is unique from everything that I've seen. I'm not that familiar with the Kiewit culture or some of the other major construction firms, but I know that his is absolutely unique and that it's been very successful, and I think a lot of firms would do well to emulate that model.

Adamson: I put this question to John McLaughlin, and it's kind of a chicken-and-egg question, but did Charlie have a fascination with concrete that he saw and then he used it to execute his design/build approach, or did he have a design/build methodology and he sort of pulled concrete off the shelf, as it were, as something that would enable him to build buildings this way?

Drnevich: Charlie, that's true, was really a concrete man and loved concrete. I think the way I like to think about it is that he looked at concrete almost as an artistic expression where he could do something with concrete in terms of, because you could form it, okay, and that that would allow him a tremendous amount of flexibility in how he designed things. I think that's why he loved it so much, is that he could do so much with it, whereas in steel where you're confined to rolled shapes or to conventional sizing, things of this nature, where he could take liberties.

He also, I think, was very sensitive to the issue of special loading, such as earthquake loadings. Pankow has patents on special connections in concrete. They're not necessarily connections, but they're joints in concrete, that are very earthquake-resistant. Concrete is also a better material with regard to fire and fire protection. So he was a pioneer in doing these kinds of things and he could see the benefits of it. The fact is that there was also an issue of control, because you can always get rebar, if you will, and you can always get concrete, but sometimes steel, particularly rolled sections, you are beholden to a steel supplier or to the rolling mills for getting these out, particularly if you need special sections. I think that he felt that he was better able to control the whole process by using concrete rather than having to be subject to constraints that he had no control over.

Adamson: That's a good point. No one's mentioned that before, so thank you.

Charlie was not just a successful builder, but a successful businessman. I just wonder if you'd care to comment on what sort of traits in Charlie made him a successful businessman just beyond the building industry.

Drnevich: I'll go back to the word *trust* and his relationship with people. The people that worked for him just loved him and trusted in him. His clients, I think, had a similar relationship. When you feel good about doing business with somebody, you're going to do business with them, but if you don't feel good about it, you're going to be reluctant or you're going to go for the cheapest price or what have you. Then, of course, as his reputation continued and the idea of getting projects in on time and under budget or at budget was of great value to him. So that was a calling card that allowed him to get a lot more work than he might have done otherwise. So I think that those are the issues. Of course, he was a very disciplined person and far-sighted. He was always looking more than the next quarter, and those kinds of things are attributes of a successful person.

Adamson: Did Charlie ever discuss with you, and by 1991 he had already sort of made this decision with the reorganization, but how he saw the company after he had passed? Was he very invested in the company outlasting him?

Drnevich: We never talked about things like that. One of the things that I liked to do when I visited with Charlie, and he seemed to like, as well, would be to talk about technical things. My guess is that he had a lot of weight on his shoulders with regard to the business aspects of it, personnel, and other issues of getting jobs and things of that nature. So when we got together, it would be to talk about technical things, which is kind of his first love, if you will, and it was a chance to not have to worry about these other things.

There's one story that I just keep very clear in my mind, and it was shortly after he had his surgery for the kidney transplant. I happened to be in San Francisco and I knew he was going in for surgery. I didn't know what the story was on this, and so I called the San Francisco office and talked to the receptionist there, asking how Charlie was, and she said, "Oh, he is hospitalized and is expected to recover fully." That's all the information she would give me.

I said, "Would it be possible to talk with Doris so that I could just let her know that I was in town and was concerned about Charlie or would he accept visitors?" She wouldn't give me any information.

So I called Joy Haystead down at the [Altadena] Pankow office. She was a special person, as well. So she said, "Hi, Vince." She said, "Oh, yes," she said, "Charlie's going to be going home tomorrow from the hospital. Here's the phone number for the room. He'd probably like to hear from you, so give him a call."

So I called, and Doris [Pankow] answered the phone and I said, "Doris, this is Vince Drnevich. I just wanted to inquire about how Charlie's doing and let you know that we're concerned about him."

I could hear from across the room, "Who's that?"

She told him, "It's Vince Drnevich."

He said, "I want to talk to him."

So she says, "Oh, here. Charlie wants to talk to you."

So I talked to Charlie and he said, "How you doing? Where are you?"

I said, "I'm here in San Francisco and I was just inquiring and I'm glad to hear that you're doing well and you're going to be going home tomorrow."

He said, “What are you doing tomorrow? Can you come over?”

I said, “Well, yes, I could come over, but you’re just coming home from the hospital, so I should not do it.”

Anyhow, he said, “Oh, I want to talk to you.”

So anyhow, he handed the phone back to Doris and I said, “Doris, you heard what he said.” I says, “I don’t need to come over.”

She says, “Well, Charlie would like you to come over, so just for a half hour come on over and we’ll have some tea and get a chance to talk with you.”

So I did, and I had my son with me at the time, so we went over to visit Charlie at the Petit Trianon [3800 Washington] and Doris was there and we had some tea, and the visit lasted about an hour, hour and a half. We were talking about concrete and a concrete conference, and to my mind, and I think to Doris’s mind as well, that that was really good therapy for him to be not focusing more on his medical issues, but to thinking in terms of his first love, the technical aspects and new developments in concrete. I shared with him the conference I was going to and how we were talking about concrete at the conference. So that was a very memorable experience, as far as I was concerned, and in fact, it was just a very vivid memory and I’m sure that it will last with me forever.

Adamson: Very good. I hope this question isn’t too broad, but to comment, as you see it, on Charlie as a leader in the construction industry beyond his company. I know he was president of ACI [American Concrete Institute].

Drnevich: ACI, and totally respected. The other things that he did were phenomenal with the American Society of Civil Engineers and with what was known as the Civil Engineering Research Foundation, which no longer exists, but he was a leader in that organization. It was basically not a research organization. I had issues with that Civil Engineering Research Foundation. I was the chairman of the Department Heads Council, of all of the department heads in the United States of civil engineering, and we were concerned that the research foundation was by its name and purporting to be spokesperson for research in civil engineering, when they weren't. They were really looking at movement of research into the practice and they were looking at innovative ideas that were ready to go into practice. But Charlie was one of the founders of that organization, C-E-R-F, CERF. And as part of the process for trying to reward innovation, they created the Pankow Award in CERF. I don't know if you're familiar with that or not.

Adamson: I'd seen the line, but—

Drnevich: Okay. That continues to this day. CERF was a subset of ASCE, it was quite independent and it was kind of going in its own direction and ASCE wasn't very happy with it as well. So they finally pulled it in and renamed it, and now it's a subset of ASCE, more under their control, and they have every year the OPAL Awards, Outstanding Projects and Leaders in civil engineering projects and the Pankow Award is given at that black-tie ceremony in Washington. So Pankow is a recognized name in American Society of Civil Engineers, and that goes to show the nature of his leadership.

If he weren't such a stalwart in the field, there was no way that something like this would be named after him.

Another recognition is that Charlie was a member of the National Academy of Engineering, which is a very prestigious organization and very rightfully so. To get membership there, you have to be a leader recognized by your peers, and it's a very tough organization to get membership in, and Charlie was a leader in that organization as well.

Adamson: If I have my timing right, soon after you came to Purdue, Charlie was also involved in getting the Design/Build Institute of America started.

Drnevich: Yes.

Adamson: Before that materialized, was that something that he talked about with you?

Drnevich: He did. I mean, every time we got together, the word *design/build* came out. As I told you earlier, it so impressed upon me that I've continued basically his legacy to this day in the way I teach the course and very strongly promote the design/build process. Some of my colleagues think I'm overly keen on it, but I said, "No, it works," and the numbers seem to be in my favor. If you take a look at the percentage of facilities being designed and built with design/build is increasing, and it's probably on the order of 40 to 50 percent right now, and as time goes by, it's likely to be larger.

Adamson: You mentioned Charlie coming back twice yearly for this Visiting Committee. By 1991, as I understand it, he had stopped coming to Purdue to recruit people. So my question is, in your time, in the decade of the nineties, what else, what other reasons would Charlie have to come to Purdue and why did he do that?

Drnevich: One was the dedication of the Pankow Laboratories. I'll take you down and show you it. At that time they were the Concrete Chemistry Laboratories, and that was a reason. In fact, I have a photo here of him and Doris at the dedication, and that was very nice. Dean Yang was there, his wife, and a number of other people.

Adamson: What year was this?

Drnevich: This is—it's on the plaque downstairs, but it's in the 1990s. We were very pleased with the support that Charlie gave to us. I mean, that's probably the strongest indication of his love for Purdue, was his support for us financially, and as head of the school, I was just absolutely overjoyed of that relationship. Budgets were always tight, and Charlie was a believer that you've got to be a leader and you've got to get out there and do things, and thanks to his support, particularly for the concrete materials area, we were able to purchase things, we were able to have staff people, we were able to get research done that couldn't be done otherwise. So to this day, that allowed us to be a very, very successful program, one of the finest in the country with regard to concrete materials. It turns out that that is continuing with the tremendous gifts that we receive

after his passing from his legacy, that we are now creating a new concrete laboratory that will be the Pankow Laboratory.

Adamson: Very good.

Drnevich: So I will take you after we're done here and you can get a chance to see what's going to happen, and I've got some people lined up to talk about it for you.

Adamson: That's great. I also understand that there's a professorship.

Drnevich: Yes.

Adamson: Endowed chair?

Drnevich: Yes. Yes, and that is being supported. Let's see. There's several, and this is coming, and I think it's—I'm not sure about this. I'll have to—I know there's one for concrete materials professorship and I know it's strongly supported by the concrete industry. I think that there is support in that from the Pankow funds that are available to us. Not being head of the school, I don't have those details anymore.

Adamson: What has been the involvement of other Pankow people, Bob Law for one, in their interest in construction management and civil engineering education at Purdue?

Drnevich: Well, practically—well, there have been a lot of people from Pankow here. Tom Verti's been here a number of times and made presentations. Rik Kunnath has been here. Bob Law is probably the most rabid alum that we have and is here at the drop of a hat. He and his wife are both Purdue alums, and as a consequence, they will come and Bob usually will make a presentation at a class when he's here, either in construction engineering and management or for us in the civil engineering program. Of course, we love to have them here. Sara's [Bob's wife] just excited about getting back as well, so they made a duo, a tremendous duo, and both work for Pankow, of course.

Adamson: Right.

Drnevich: Of course, his son came here, so I have to keep track on their children and what they've done. They have two boys and one went here and the other one went to—where was it? In fact, I had one of their sons in class, in soil mechanics class.

Adamson: Apparently, one of those sons, I guess they've broken the—not the rule, but the tradition at Pankow not hiring sons or family members, but when I interviewed Bob Law, he told me that his son was now working at Pankow.

Drnevich: Was that Keith?²

Adamson: That was the first case.

² In the interview, Professor Drnevich mistakenly referred to Bob and Sara Law's son as "Dane."

Drnevich: Case of nepotism. [laughs] Yes, well, I know when his son graduated, Bob was just ecstatic, him and Sara both. They were just gushing all over the place. Then he went to work in the L.A. area for another firm and worked for them for five or six years, I guess, before moving over to Pankow. So I don't know the details of it.

Adamson: When I interviewed Bob that weekend, he was getting ready for his son's wedding and that was the one thing he said.

Drnevich: Yes.

Adamson: So you've already mentioned seeing Charlie at the 3800 Washington when he got out of the hospital for his kidney transplant. Were there other occasions when you were there, and if so, when was that?

Drnevich: Well, we were there, for example, for the Rose Bowl. I mentioned that earlier. That was January of 2000 [2001, or December of 2000]. Purdue was the first time in the Rose Bowl for many years and we got creamed by Washington in the game, but nonetheless, Charlie had a beautiful lunch for us at his house and there were many Purdue alums at the house. That was a very special occasion. I was there on one or two other occasions, generally as head of the school. I would go to various parts of the country every year to visit with alums, and Southern California was no exception. Charlie would really roll out the red carpet and have his staff make arrangements for us. It usually was someplace near Pasadena in one of the local hotels and we'd invite all the

alums from the area and have a nice dinner and I'd give them an update on what was going on here at Purdue. They loved it, and it was a good way to establish friendships and relationships. So Charlie was a major player when we went into the Southern California area for things like that.

Adamson: So obviously you had a look at his art collection.

Drnevich: Yes. I'm not much of an art collector, but again it shows you a dimension to him and how deep he was in different areas. His Russian icons and his South American art was—where did he find the time to do that? I don't know. Then his passion for things like fishing, and occasionally we would get some dried fish in the mail that he had caught in Alaska or someplace.

Adamson: Maybe you can marry these two questions, but in that video that I mentioned and you mentioned having a copy of, Charlie stated that, in his company, "Innovation has been our main theme." If you can use an example of some of the technical discussions you had of illustrating that.

Drnevich: Yes. Well, I'll go back to what I said earlier about concrete and his use of concrete. It would allow him to build something that he knew would handle the loads better than any other conventional ways of doing it, and that one joint that they created is just an example of that.

Another innovation that I remember is on this Gateway Center. There was a very different type of center and they hung the façade of the center from the structure itself and that's fairly common, but the nature of this façade was so different and the procedures for connecting it, the type of connections, Charlie's firm designed and they were unique and allowed them to produce the façade much more quickly than it would have been by conventional means. So those kinds of things, I'm sure there are thousands of cases like that where they would do things that seemed to be impossible or to make things much more efficient to do. That's one of the reasons that they were successful financially. They knew that they could come up with special techniques and innovations in the process of satisfying the architectural needs of the facilities.

Adamson: Now, part of the design/build approach is to sort of bring the architect into the room. Did Charlie ever have any stories about how, just in general, the design builder handles the architects and how do you talk about that to your students?

Drnevich: Well, the thing about Charlie is that back in the fifties was the golden era, if you will, of the civil engineer. A lot of the post World War II construction was going on and, actually, from the 1900s through the 1950s was perhaps the golden era of the civil engineer. The civil engineer was the supreme person on a project and architects were underlings, if you will, but with time since then the business and the architectural people really started taking the roles and as a consequence then the civil engineers became subservient to the architects. They [architects] became very strong in the process and controlled the designs. While architects played major, major roles in Charlie's firm, the

civil engineer and Charlie was the still the person in charge and the architects were then part of the team, truly an essential part of the team, but there was a working relationship there, which I think was very healthy, healthy for both.

And this is one of the beautiful things about design/build that makes me very strongly supportive of it, is that in the process you're forcing these people to work together. In the conventional process you have the architects coming up with their dreams. They may have their engineers on staff or they may have separate engineering firms that go and produce the structure and facility that the architects have designed, where in the design/build they've got to work together.

Then most important, from my perspective, is that as the construction is taking place there's a feedback to the architects and the engineers about what's going on, and there's a learning process. So that feedback is very real and very time relevant, whereas if you look at the conventional process, a lot of times the architects and engineers who design a facility and hand the package to the owner and the owner bids it out, the architects and engineers could be down in the ranks never see that facility again. They don't know whether their designs worked or not. And many times the construction people say, "Well, we take this design with a grain of salt, we know how it has to be built and we know we're going to have be responsible for it once it's up." So they maybe make substitutions or things like this so that they can get the actual project done.

So that feedback process is missing in the conventional design-bid-build process that exists in a good design/build function. So that's my take on the process and it's one of the reasons I'm so strongly supportive of it.

Adamson: I think we've ticked off Charlie's support for the civil engineering department, the lab, and other support, is there anything else that he's contributed to at Purdue or the civil engineering department that we haven't mentioned?

Drnevich: There may be, but I don't know of them. A person like [Purdue University President Emeritus] Steve Beering would have been aware of some of these things. I know that Steve and Jane Beering were close to Charlie and enjoyed visiting with him and vice versa. So that would be—and then the people in development would probably know about that. I wouldn't be surprised, but I knew that Charlie was very strongly in favor of civil engineering and his support for civil. I'm sure the dean put the squeeze to him for money here and there and some of it, he may have given some over the years, but his love was civil engineering, and Charlie told me that straight out. I remember going to dinner with him one night. I visited with him at the office and he said, "Let's go to dinner," and he took me to the Cal Tech Faculty Club and Doris was connected with Cal Tech at that time. So they had access to the club and we had dinner there. I remember him very vividly saying, "Vince, civil engineering at Purdue is my school and I'm really strongly supportive of this."

Just reaffirmed that both financially that he was behind us and wanted us to be very successful in what we did. That's a lot of weight on our shoulders to follow through on that, but that was good.

Adamson: Not only as a Purdue graduate, he would see the value in the education he got. Did he ever articulate what he saw in Purdue graduates that he might not have seen in a

Michigan graduate or another person? Why didn't he spread farther a field to look for people?

Drnevich: Well, he felt that we provided a very in-depth program. To give you an example in the past fifteen years or so civil engineering programs have dwindled in the number of credit hours required down to a hundred twenty, hundred and twenty-four, hundred and twenty-eight, we're still at a hundred and thirty-three credit hours. Students at Purdue in the civil engineering program have a very flexible program of study, so they can take in-depth two or three courses in a given area and come out with an expertise that a lot of times students won't get with a master's degree. So I think those kinds of things and the fact that the students came out of our program ready to hit the ground running and were very solidly educated was something that he appreciated and wanted to make sure to maintain.

I mentioned earlier that he said, "I can teach them how to manage a construction project, I can teach them about businesses and I want you to teach them about engineering. I want them to be good engineers first," and having the technical courses was very important to him.

Adamson: Would he, even in the nineties when he'd come to Purdue, would he talk to students? I'm told that that was one of the things he liked to do, at least initially when he used to actually do the recruiting.

Drnevich: Oh, yes. Let's see, I've never had him take one of my classes. When I got here I don't recall having him speaking to students in class. It might have been at things like Chi Epsilon gathering or what have you. I think one of the—now that I recall, he was made a national honor member of Chi Epsilon, which is the civil engineering honorary organization. He was nominated for that, but before he could be, he had to be—one of the prerequisites was that you had to be a chapter honor member. Shortly before his death he was too weak to travel and the students wanted him to be a chapter honor member, and so they put together a delegation of two or three students and the faculty advisor and they went to his house and installed him as a chapter honor member.

That must have been special for him. I was not one of the parties that went, but it was a very special time for the students and I think it was probably one of his last connections with students. I know they'll never forget the experience of having been out there and visited with him.

By the way, the national honor member of Chi Epsilon is a very select award. There's one a year and the organization has only been in business since 1929. So there are seventy or so, or eighty some, and Charlie's one of those. Stephen Bechtel's another, and people of that caliber are among that list. So they're a very select people.

Adamson: Since 2004 there's been the Charles Pankow Foundation that's funded research in the building design, in construction, now you've mentioned the laboratory that he's established here. My understanding of the story and the foundation is that prior to the foundation that Charlie's idea was that all of what the foundation now does would

be done at the university level and I'm wondering if he talked about the foundation before he died or it just kind of materialized?

Drnevich: He didn't talk about it to me, so I can't give you much information, but I know that Bob Tener, who is the director of the Foundation, is a former faculty member here. I was the person who hired Bob when I was head of the school. Bob was an ex-military colonel and was working on the superconductor, supercollider project in Texas, down near Amarillo, Texas. Then that folded because of the funding. So he became director of the Dallas city schools. I don't know if you knew that or not.

Adamson: No. I had breakfast with him last week; he didn't mention that.

Drnevich: No, he probably won't mention that. But then he was traveling up this way and his wife's roots were up this way and I was visiting with Bob Bowen, who's another benefactor of ours in Indianapolis, or was it maybe Dick Doyle, Richard Doyle.³ But anyhow, it was either Bowen or Doyle called me and said, "Vince, there's a guy here visiting me, his name is Bob Tener, and we think you need to talk with him."

So I said, "Sure, send him on up."

So he came up here to West Lafayette and I was truly impressed with Bob. So we set the wheels in motion and made him a faculty member in the CEM Program. Bob was a tremendous asset to our program, a tremendous asset. He knew the construction industry exceptionally well, was able to interface with the—and he was in charge of this

³ Professor Drnevich is "fairly certain" that the individual in question was Ed Doyle, a principal in the firm of RQAW in Indianapolis.

intern program and that was probably the pinnacle of the program under his direction. He had a number of innovative ideas that he created and had the industry just so excited about Purdue and the CEM Program.

Then Bob and his wife, Sara, Bob decided that he had done his job here at that and then moved on to Granite Construction as the head of education and then to the Pankow Foundation as the chair [executive director] of the Pankow Foundation. I think he's continuing in that role in an exemplary fashion. So I talk to him from time to time. He'll call me more than I call him and say, "Vince, I want to bounce some things from you." I know we have at least one project with the Foundation.

What I have done is recently put some of our new architectural engineering faculty in contact with Bob because their research is, at least one of them is involved in taking the technology for curtain walls, green curtain walls, and having that technology put into practice. The idea with these curtain walls would change with the temperature and the seasons. So it's an active curtain wall system as opposed to just a plain wall that doesn't change with regard to elements and temperatures and other kinds of things. So there may be something in the works for that.

Adamson: I made a note of this: in 2006, the \$338,000 research grant from the Foundation for design procedure for dual plate composite shear walls. Is that something that—

Drnevich: That's down in the Bowen Lab and we can go down and visit down there.

Adamson: Now, I've kind of feel like I've skipped through to the end, but one of the things that I just wanted to make sure I've covered is any other involvement that Pankow people or the Pankow Company has in shaping civil engineering or CEM training at Purdue that we haven't talked about?

Drnevich: I think that pretty well covers it. Their being here frequently, the hiring of interns, hiring of our graduates, the primary ways, and of course, the funding is a very important portion and having impact on—it allows us to hire the best people to continue our programs, to do top-level research that couldn't be done otherwise.

Adamson: So now it's up to people like Bob Law to continue that tradition?

Drnevich: That's correct, that's tradition. That's correct. I think he's up to the task, although he'll never fill Charlie's shoes.

Adamson: Right. Now, one of the things that since Charlie's passing there are six general partners and I believe Joe Sanders is one of them, but I believe the other five, or at least four of the other ones, the ones I know of, are not Purdue people.

Drnevich: Yes, Tom Verti is from Washington.

Adamson: Washington and Rik Kinnath came from Detroit.

Drnevich: Yes.

Adamson: Dick Walterhouse came from Michigan. So I find it interesting that so many non-Purdue people rose to be running the company.

Drnevich: But that also makes a statement about Charlie.

Adamson: Exactly.

Drnevich: Yeah, that he is looking at the person and their abilities and character and goes on that basis, and you've got top-notch people there.

Adamson: Do you have an anecdote or anecdotes that illustrate something about Charlie that we haven't touched on so far?

Drnevich: No, I think I've perhaps shared with you most of the anecdotes that I have and many warm memories is the best way to describe those. Again, I'll say that he was able to establish a personal relationship with people, and I felt, as I was a close personal friend of his, and the story about him in the hospital and wanting me to come by and visit made me feel so special. So he had a way of doing that with people.

Adamson: Well, I think we can end it there. Thank you for your time.

Drnevich: You're welcome. It's been a pleasure. Anytime you talk about warm memories like this it's a pleasure.

Adamson: Great. Yes.

Drnevich: Good.

[End of interview]