

Oral History Interview

with

ROBERT LAW

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Pasadena, Cal.

By Michael R. Adamson

Adamson: Here we are, Friday the 25<sup>th</sup>, at the offices of Pankow Builders in Pasadena.

This is an interview with Bob Law, who is currently working for the firm.

We'll start out, if you can just talk about your college, what you studied, when you graduated, and then how you came to Pankow.

Law: I started at Purdue University in 1968 and went through essentially the brand-new program there that they had in interdisciplinary engineering. But the major of that was in structural engineering, so I had building construction, is what I was mostly interested in. Then I went on for a master's degree there in construction management.

I guess the interesting thing on that is that working as a teaching assistant at the end, getting ready to graduate, my professor suggested that I go to this Continuing Education Conference being held at Purdue, and the principal speaker of the conference was Charlie. He's talking on tilt-up. And myself and a good friend of mine, Dean Browning, who's also a teaching assistant in his master's program, both of us went to this conference, armed with our résumés. I talked to Charlie at one coffee break, and Dean talked to him at another coffee break, and we sat on either side of him for lunch, talking about ourselves and giving him résumés, and both of us were given job offers, then come

out for a company visit, and both of us hired on at that point, and Dean and I are still with the company after thirty-four years. [laughs] So that was kind of how we got our start in the whole process.

Adamson: What has your career in Pankow consisted of in terms of experiences in and titles and promoting through the system?

Law: I started as a field engineer in—I guess it was in June 1974, went through, worked on the PT&T [Pacific Telephone & Telegraph] office building, which is actually right behind you, that building right there [points], in San Francisco. After that, I worked with Alan Murk, who you'll probably be talking to as well, and had a really good time and a really good education. The company at that time, and I think Charlie started the whole idea of the supervisory people would be good educators, too, teach the skills necessary to put the project together.

And on that particular job, I had a really good experience working with Alan, and principally under the direction of Charlie, that we would go in—I would consider that would be one of the purest elements of design-build because we ended up designing that building. The bay widths and the beam lengths were designed to fit within the radius and the weight capacities of those two tower cranes that are on it. So we modified slightly the size of the wall panels and the beams to handle the weight capacities of the two Pankow cranes on that project. So the building was actually designed to a large degree over the best circumstances to actually build the building, but without really sacrificing quality. We were able to give a much better cost and build it in a lot faster time, because that was

a 430,000-square-foot building that we built, structured out in around nine months, finished it in less than a year, which was a pretty significant accomplishment at the time. So that was my first project.

Then the second project, I was transferred there to USC parking structure down here in southern California, and I worked with a first-time superintendent, Tom Verti, who is now the president, and had a really good time working with him on a parking structure. We finished that project in about six months.

Then I was transferred to Braintree, Massachusetts, which is just south of Boston, where we were enclosing a shopping center for Winmar Company, you had mentioned, who was bringing us many different locations around the country. There I was promoted to project engineer, worked with a number of our longtime individuals. One was Norm Husk and Tom Rouhier, who aren't with the company anymore, but good educators as well as good managers.

When they left the projects, I was there for about four years on the mall enclosure, mall expansion, and at that point in time towards the end of that project, I was elevated to superintendent, working on the project as much as anything because everybody left and I was the only one left on the project, so I was able to handle the responsibilities for the mall expansion and I worked on those areas. So I got a really good experience at that point understanding what it was about for the construction of the building.

In the meantime, between that time, we had a slowdown in the area because of the client's needs, and I was transferred back to southern California for about six months, working in Fontana, California, with Tony Giron, who was another good superintendent, longtime superintendent with the company.

Then I went back to Boston after that, and went to Braintree and was the superintendent on a parking structure that we built for the mall, same location, and then there was another mall expansion at that point.

After that, came back and came into the Altadena office as a superintendent for a couple of years—came back in 1980, and the projects that I was supposed to go on never went for whatever reason here, issues with the clients and stuff, but it started to evolve into working with Tom [Verti] on all the estimates that were going on, and in 1982 became an estimator—the first time the company had a dedicated estimator. So I worked from '82 to '88 as estimator, and in 1988 became chief estimator after the other chief estimator was let go. Then I've been working as chief estimator since then, since that time.

Adamson: So superintendent was a position you could be in the field and in the office both?

Law: Well, superintendent is a position that you would be in the field. I was a superintendent officially, but in the office because there wasn't a project to go. In the early eighties there wasn't a tremendous amount of work. We've often had a lot of flexibility in what we do with our individuals, and I was able to be a superintendent or an estimator, so I stayed working as an estimator.

Adamson: And what does an estimator primarily do?

Law: As the estimator, we're a little different than most companies because we get involved in projects in the very early stages of the projects, so conceptualist, I mean, is quite important and you have to have a pretty good understanding of how buildings go together and that you knew that from estimating. Having had that experience out in the field, that gave me the ability to envision what it was going to take to put the estimate together for a project that had maybe five sheets of drawings and just very, very, very simple information on it. And that's how we encourage our estimators now, too, to have that level of being able to understand what the project looks like and then take it all the way through the course of the estimate to the final completion of the drawings and have the final number that goes to the client.

Adamson: So is estimator part of business development, or are these projects already sold?

Law: Actually, it's a very large part of business development, because so many of the early stages of the estimate are there to help develop the client, so I work very closely with the regional manager as well as the person in charge of business development. It makes it, I think, a lot more interesting working with multiple types of projects. We can have three or four projects coming through in a week that we're looking at, trying to turn those over and get a good idea of what the budget would be for the project so that the client could start making decisions on what they want to do.

Adamson: Taking Winmar as an example, how did the relationship between Pankow as a contractor and the developer, how did this business relationship work?

Law: Well, that was very early on with Charlie and the group that we had with the company, and this is history prior to my coming with the company, but as I understand it, Pankow built their very first shopping center in northern California. I think it's Westgate Shopping Center in San Jose. Charlie's approach was to do the project's design-build lump sum, with no change orders and no issues with the completion, and just get the job done and do it in a very fair way. That has been a business construction technique that he's always been adamant to work towards and, no matter what, come up with the highest quality and keep it so that the client is happy. He made some good friends at Winmar by doing that, and they stayed with our company for many years, just project after project. These started out as being relatively small jobs, some of them, but the relationship lasted until Winmar started building much, much larger projects and much more complicated projects, which we took on and completed successfully. So that's kind of how we started with Winmar.

The projects that I worked with on Winmar—this is after years and years of having done lots of good work for them, so it was in everybody's best interest, particularly mine, to make sure that I didn't do anything that was going to disrupt that relationship, so we just kept it going. The relationship between ourselves and Winmar didn't really change; it's just that Winmar's product—they decided to stop really doing development and do more building acquisition, existing building acquisitions, and just owning the buildings that they had acquired or we had built. So they weren't really

looking to building new buildings, so the opportunity for us went away for a little while with that.

But we were able to pick it up with another client, that was Corporate Property Investors in New York, that was kind of interesting, because we were interviewing with them on the Brea Mall and the Westminster Mall here in southern California, and in our résumé we were showing them the mall in Braintree that I had worked on, coincidentally, and we showed them the mall as one of our examples of what we could do to mall renovations, and they looked at it and said, “You know, we own that mall.” As it turned out, when Winmar was selling some of the properties that we had worked on with Winmar, one of the properties in Braintree was one that they sold to CPI, Corporate Properties Investors, so that had a pretty good “in” with them, and we were able to develop the relationship with CPI much like we had with Winmar.

We built the Westminster—actually renovated the Westminster and Brea malls, and they were very happy with the work they did and said, “You know, we’d like you to look at this project in Long Island for us, because we’re not happy with the client [that is, the general contractor]. They’re not as proactive as what you are.” So we then moved our team back to Long Island and did three phases of the Roosevelt Field Mall in Long Island, and they’re very happy with that. Then they said, “Well, we have this other mall, Walt Whitman Mall,” just a little further east on Long Island. Huntington Station is where that is, and we did a mall renovation of that project.

Again, we were having very good relationships with CPI, but then they changed their acquiring structure. They were bought by Simon Company out of Indianapolis, who had a different procurement method, and so that the work that we had been constantly

working with CPI pretty much went away because of their being acquired by another company.

So I think the whole point of what Charlie was really instilling in working with this was doing a very good job for the client and put it into their best interest to hire us again for repeat business. We worked very hard to keep the client happy, as we do right now, and as a result, there's an awful lot of repeat business that we get. In many cases, it's not necessarily the same company, but people move from company to company, and even now we're getting repeat business from people that are in a new company that we worked with when they were with a former company. So that business model that was instilled in the corporate culture from the early, early beginning of the company has come back to make us very successful, I feel.

Adamson: Renate [Kofahl] sent me a project spreadsheet of the projects she could come up with, and there's a mix between new buildings and redevelopment or renovations. Can you talk a little bit about over time how that—were you primarily involved in new buildings, or how much has renovation become part of the business?

Law: Well, we've had from pretty early stages—it started out as new construction, but I think some of the early areas of renovation that I was personally involved with was the mall in Braintree. We ended up—there's probably some projects that we had that we were renovating prior to that, but from my experience, this was a project that Winmar had paid a consultant to do a study on the mall, and the mall consultant came back and said he



can't do it. It's not possible to do this renovation of this particular mall, enclose the existing mall while keeping it open.

So the friends from Winmar talked to the friends at Pankow and said, "You know, we've been told we can't do this."

Charlie and Dean [Stephan] said, "You know, there might be a way of doing this, so let us take a look at it." Well, we looked at it and we figured out logistically how it would be possible, and we went forward. We were able to successfully do it. We were able to keep the mall open while we were doing it, and that part came back being very successful for that particular mall. It was an outdoor mall and they wanted to enclose it, put a roof over it, but they didn't want to shut it down in the meantime because of the revenue stream that they needed to pay for the mall renovation. In the process of enclosing it, there was a lot of things that had to be completed, had to be finished out in that.

Then when we discovered that we were able to do this, we started tackling more and more complicated projects for Winmar and for other developers. Probably the most difficult technically, technical renovation, was one we did in Riverside, California, for the Tyler Mall, where what they wanted us to do was put a second story on top of an existing one-story mall. It was an enclosed mall, and they wanted us to put a second story over the mall, not close the stores, keep the stores open, and that part wasn't too difficult; other contractors had done that. But what they did not do is put the mall over top of the roof, because it would make it too high from the first to second floor. They wanted that floor to be about four feet lower than the existing roof. So we had to figure out how to make that work. Basically, logistically, it had to be a circumstance where we could not

only put the floor in, but also support all of the ceilings that were in the existing stores from the new floor while we're building the new floor in the space in between the mall store ceilings and the store roof, and the roof was supporting all that. That was fairly difficult and logistically challenging.

But the other aspect of it is that we couldn't basically just pour new footings; we had to drive pile on these to support the new loads, so we ended up suspending pile-driving apparatus over top of the existing mall with a huge crane, driving pile through the roof through the store into the ground, and then doing the pile cap on top of those. Since we were close by to a residential neighborhood, we only had a very short window from six in the morning to about ten o'clock when the mall opened, when we could actually drive the pile for this. So logistics was incredibly complicated.

But Charlie's whole point on solving some of the really difficult challenges that had been given to us was take an engineering approach and work with that and create solutions that someone says, "Boy, this is virtually impossible to do this. Look at all the challenges you've got." Most people would just kind of walk away from it, say, "No, we don't want to tackle that." Things of this nature, to our knowledge, hadn't been done before, but it didn't stop our willingness to jump in and try to figure it out and make it make sense.

We worked very closely with the structural engineer, as you can imagine, and all the way down from the electrical designer, the electrical contractor, it was all design-build. The entire project was design-build, and working with the design-build specialty trades in electrical and HVAC [heating/ventilation/air conditioning] and plumbing and fire sprinklers, working the whole element of reengaging the systems below the ceiling

while we're taking it out above the ceiling was logistically pretty complicated. But we were able to figure it out and make it work, and it became a successful project for the owner and for us, too.

So it kind of evolved into the renovation world by seeing that there's a market here for that and we can come in and tackle some fairly challenging things. We've had a good history of doing it, and it became a good market for us. In southern California, at least, and in other parts of the country, new malls are being built in other locations, but there seemed to be a real interest in upgrading the malls that were existing. So a lot of people were doing that, and different malls had then to keep up with their competitors just to draw people to come to the malls. So there was a big market for mall renovation for many years, from, like, the late eighties to the mid-nineties.

Adamson: Including Paseo Colorado.

Law: Including Paseo Colorado, yeah. That had its own unique challenges with three different owners on the same parcel. The below-grade parking structure was owned by the city. The retail was owned by TrizecHahn, a different mall developer. That was a whole different product type that had really been explored, because it was putting retail in the ground floor, and that wasn't so unusual with retail on the ground floor, but then putting residential on top of that was fairly unique at the time. [Post Properties was the residential developer.] There's a lot more of that product coming out recently. But that whole thing was shut down while we were doing it, but it had to be surgically demo'd and worked through because we weren't taking everything out at one point in time. We

were keeping some of the structure in that and strengthening other parts of the structure to handle the added roof loads or the floor loading of the apartments. The schedule that was given to us was extremely aggressive, so we had a lot of work to do in a short period of time. Towards the end, it was frantically finishing it all up, but we were able to complete it on time and it ended up being a very successful project, I believe, for them, so successful that the developer sold it and made a lot of money.

Adamson: That's great. So how many Pankow people would typically work on a Tyler Mall or a Paseo Colorado, project, and then who would be retained to do other functions that Pankow directly didn't do?

Law: Well, at the early stages, as an example, on Tyler Mall, we were looking at that for different scenarios, different options for them to do it. This was a project that was in preconstruction before it ever got to the construction site. We were looking at that for about five years, and the owner would come up with a scenario of what they would like to do, and we would price it, and then they would come up with a different scenario and we would price that. Over a course of time, they determined that putting the other, a new retail space over top of the existing, was the best way for them to work with their pro forma.

So we had our estimating group working on that off and on for about a five-year period, and then once the construction got started, we'd have a superintendent, field superintendent—in Tyler I think we had two field superintendents because there was the mall renovation as well as we were building a parking structure at the same time.

Usually, there would be two project engineers and anywhere between three and four field engineers, and then an office manager that would be handling the accounting portions and that. So that would be a typical crew that we'd have. Then beyond that would be the craft foremen and then the carpenters, laborers, and cement finishers that we would hire for the job.

Adamson: Then who actually designed these structures?

Law: I'll use Tyler as the example. With that, in the design-build mode, we actually hired the structural engineer and all of the MEP [mechanical, electrical, and plumbing] designers. I think in that particular one, the owner kept the architect and hired them directly, because they wanted to have the control of the design, what was going in, and they felt that they were able to have that control a little bit better by retaining the architect.

But all of the technical designers we had on our—we would hire the structural engineer and the other MEP engineers. So we don't have in-house engineering. We've determined over the years that it makes the most sense to hire different consultants on different projects, because one engineer and particular architect can be particularly adept at retail, but they don't have a lot of experience in office buildings or parking structures or hotels, and there are other, better designers that can handle those particular building types than they would be for another.

So by being able to pick and choose the right designer for the right job, that served us very well, and to a certain degree, after working in the design-build arena with

a lot of these designers, they decided that is pretty good. They work with a contractor that allows them—it gives them the ideas that they can put on their drawings one time and then they are actually able to make a little more money without having to go back and re-churn their designers and redraw a whole lot of drawings, because they would draw something and they think it's the way that the contractor wants to build, and that contractor comes in and says, "Well, we'd like to do it this way." So the architect has to come back and redraw that. They may not necessarily get compensated for all the redrawing that they have to do.

So by our coming in, working in the design team at the very early stages of the project, they're able to design the project and we're able to get what we feel is the best, most economical ideas into the project at an early stage. Everything happens a lot faster. We end up having to draw the plans just once, and after going through this process with them a couple of times like that, they start marketing our company to other clients that they work with. So by having a group of other designers out there and they're working in their own product type, and they seeing that we really strive to work together as a team with them, we've found that there's other designers who help market us to other clients that they have access to that we don't. So that's been a successful method for getting the Pankow message out there over the years.

Adamson: So what has determined what types of buildings Pankow has built? The economics, the expertise, or—

Law: Well, I'm not sure that we've found a building that we wouldn't want to build. We've stayed out of heavy construction. We don't do highways. I guess if you consider a refinery, I think that's more of a plant. We don't do refineries. But we've done everything from office buildings; hotels; regional shopping centers; apartments; condominiums; special event/basketball arenas. We haven't done that much tilt-up, but we have done some tilt-up construction. There are other people that have used that or worked at that as a specialty.

Adamson: Can you explain tilt-up construction?

Law: Tilt-up would be a contractor coming in with a fairly simple building, they would pour the slab, the slab on grade, and then use the slab as the base to cast the exterior wall. Say it's probably twenty foot wide and thirty foot high, just in one panel with a couple windows in it, maybe, maybe not. These warehouses are typical—you see that. Then they'd drive the crane on to slab and then pick up the panel and tilt it up, ergo, tilt-up construction, and then they'd basically just build [cast] all the [concrete] walls on the floor like that with edge form around it, pick [tilt] them up and brace them off, and either put a steel truss roof system with tube steel columns, or a panelized wood roof system in. It's a very economical system for a particular building type that we've gone into.

[Begin track two]

Adamson: So, just picking up where you left off, did Pankow always operate as a general contractor then, or is that its typical role, or how has that changed over time?

Law: That's been the typical role. I think in the very early stages on some of the large projects, we worked with a joint-venture partner, but that was in the early, early stages before we really became completely established. But ever since we've been established, we've always worked as a general contractor or design-builder. That's the other classification where we then would actually hire the engineers, all of the designers, and then we would provide the construction services as the general contractor.

Adamson: Okay. What qualities distinguish Charlie Pankow as an entrepreneur?

Law: Well, there's a lot of people that probably can answer that, too, but what I saw was that he had the unique ability to have an uncanny business sense, along with a very high level of curiosity based on engineering support on his own. He had talents in so many different areas. He could drill down to the root of an issue, and, in fact, that's what's kept an awful lot of us on our toes, because we knew we were having a meeting with Charlie and we would study up with all the different things we thought he was going to ask. And within thirty seconds, he would drill down to the questions that he could see we didn't know the answer to. [laughs] So we'd just work harder to get the right answers for him. He had that sense, and I think not only with the people of the company, but also could drill down with clients and really determine who the right people were to work with.



He's pretty incredible, because there were some times that there were projects that we really wanted to do, and he met the client and he'd say, "We're not doing this job," and said, "Okay, well, that's your decision." And to find out they'd work with somebody else and the project went bad because the developer was—there was something wrong. He could see something wrong with the developer that nobody else could see, or the owner, and he kept us out of a lot of problem jobs to a large degree because of his business sense.

So I think an awful lot of it was the really good businessman, coupled with a good engineer with a high level of curiosity, and he constantly used the question why. Why can't we do this? Why can't we do this? How can we do this better? How can we do this faster? Constantly looking at new ways and challenging us to look at new ways to do things. So that was, I think, a really good education for all of us in the company, those that had the fortunate opportunity to deal directly with him.

Adamson: How has the firm been able to sustain that sort of entrepreneurship since he's passed on?

Law: Well, like I mentioned, I know he challenged me personally to step up the levels, and with his particular philosophy, he did that with everybody, with everybody else, too. And so I think what has happened is there's a large number of people that have pretty much developed his philosophy and brought that into the corporate culture.

Adamson: And stayed on.

Law: Yes. And we're continuing that. Part of that is in, too, respect of the man, for Charlie, but it's also demonstrated that it's a really good way to work a company. There are other companies out there that I guess they're successful in their own way, but we have the ability and we've seen being successful economically, but also having or being able to maintain a really good relationship with the industry, there's a high value in being able to feel good about what you're doing in your career, and some people I know have successful careers but they don't like what they're doing or ultimately like themselves. With the way Charlie kind of instilled his philosophy, there's a lot of people that are able to feel good and do well at the same time.

Adamson: What was his style as a manager?

Law: He was pretty demanding. He was looking for and promoting excellence for every aspect of what he would ask us to do. If he could see that you understood what he was asking the first time, he would not micromanage, but if you didn't catch on or you resisted or whatever it was, he would start to get into a micromanagement role. That bothered a lot of people, but I think in the long run, people could start to come around after a little while of seeing that. I think the whole goal for Charlie, as I saw it in my experience, was that he was really looking for us to just step up on our own abilities and managed us that way.

Adamson: How did Charlie develop the organization's capacities, training, mentoring and so forth?

Law: Yes, he would go out of his way to seek out the right person for the right job. The people that came into the company were almost totally coming from an engineering background, because he felt that the best way to develop the company, and this philosophy was to solve problems in an engineering manner. So he was looking to have engineers who had the technical ability to solve problems—engineers that could solve problems in the right roles, and with that, he sought out engineers not necessarily who did the design, but who could work very closely with the designers, particularly the structural engineer, that we would determine a large number of the solutions in collaboration with the structural engineer. When we had people that could communicate and develop the confidence with the engineer, we ended up having some really good cooperation with them, because they knew that we knew the challenges that they had and we were bound and determined we were going to work on a cooperation basis with them to solve the issue. So I think that was a large part of finding the right people, particularly with the technical background to be able to solve a lot of the challenges that he knew we were going to undertake.

Adamson: What determined how the firm expanded in terms of opening offices and then who would staff those offices? Were they people sent to the offices, or were they local people brought into the firm? How did that work?

Law: First we expanded from California to Hawaii in 1965, and Charlie sent a former project manager, George Hutton, over to Hawaii on a particular project that we called a salvage project, the Campbell building, Campbell office building on Honolulu, that the client who—who knows how Charlie got a hold of this contact—had finished a design on a building in the traditional way and put the whole thing out to bid and ended up with a project that he couldn't afford to build after he had spent all the money doing the design on the project. That's what we call a salvage project. He came to Charlie and said, "Well, what can you do for me?"

Charlie looked at it and had a strong hand in redesigning the project and essentially put it into a mode that would work economically for the client. So we ended up with this project, and he sent George over to Hawaii to build this particular project. The story goes that when George finished the job, he said, "Well, what do you want me to do now?"

Charlie told him, "Well, look around for some more work." So we ended up doing some pretty low-key type of projects. It was strip malls and little small houses and things of this nature. But then we started getting into some other projects and using the engineering approach to solve the challenges on the job. We got into some pretty good-sized projects. I don't know if you want to kind of move into some of the technologies a little bit.

Adamson: Sure, we can go.

Law: Because a large part of it, we were one of the first users of slipforming and the flying form techniques of building construction. There were other companies that had slipforming. Slipforming was a method used to build grain silos, that had been heavily promoted for using that technique. Charlie, in the early sixties, and even actually before when he was with Kiewit, was promoting that and the use of the vertical elements of the building, particularly the walls that would go up within the building.

We used that technique to build a couple of projects in Hawaii, Kauluwela Elderly, and put in the application of using flying forms, which essentially is just regular scaffold towers that you build up one layer high, but it's all connected so you have a series of scaffolds that may be twenty feet wide and forty feet long, sixty feet long, something like that, and all the scaffold pieces are all connected. So you can actually, once you've finished pouring the concrete and the concrete has come up to strength, just slide this whole assembly out of the building, hook it onto the tower crane and pick it straight up and move it right back on top of where it was the next floor up or two floors up, depending on how many floors that you have with that.

That was a technique that we used basically in the late sixties, early seventies, started working in that, using that mechanism where we had built some projects in like 1964 with a joint venture company that provided the slipform jacks, but Charlie saw that there was a better way of working these. They just slide right into the slipform side of things in the technical innovations that we had.

You had a question about how we were promoting—we were one of the first promoters of slipforming, but there were other companies who were doing slipforming, too. So how did that relate to what we were doing? The slipforming at that time was a

mechanism that used hydraulic jacks, which were very high-strength, high-powered jacks, fairly expensive, that had a lot of capacity, that essentially you had a whole lot of load put onto each of the jacks. Are you familiar with the slipforming?

Adamson: Only what I've read in a couple of articles.<sup>1</sup>

Law: Because there's a picture of it right there. [points to photo on wall of office]

Adamson: We can elaborate.

Law: Yeah. Sure. I can show you. This is PT&T, San Francisco, and this whole mechanism is about forty feet wide and about a hundred feet long, and each one of these vertical supports is a slipform jack. Right in the center of the wall of one of these—if I draw it on yours, you can keep it if you like.

Adamson: Sure.

Law: Consists of probably a four-by-twelve header with four-by-twelve whalers coming down, and these would connect onto the formwork system and you'd end up with concrete [walls in the core]. So this section in here is all concrete. This is the form that's supporting the concrete, and what you have in this mechanism is the support for the

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<sup>1</sup> See, for instance, "Sophisticated Slipforming Produces a Floor a Day," *Engineering News-Record*, 2 July 1964, 56–7; "Zig-Zag Dormitory Is Slipformed for Economy," *Engineering News-Record*, 29 February 1968, 26–8. For a detailed discussion, see Charles J. Pankow, "Slipform Construction of Buildings," chap. 34 in *Concrete Construction Handbook*, 2d ed., ed. Joseph J. Waddell (New York: McGraw-Hill, 1974).

slipform jack that pushes on a rod that's embedded in the concrete. This has jaws [clamps on vertical bars] that push down against the concrete and then raise the form in a vertical position.

Now, the rest of the industry were using, as I mentioned, hydraulic jacks, which were very high capacities, and the arrangements of those jacks, you had to put jacks closer spaced, because of the ins and outs of the walls, than would match the capacity of the jack. The jack was a lot higher capacity than what you really needed.

One of the things that Charlie actually developed with some other people was a pneumatic jack, lower capacity, that didn't need as heavy a lifting mechanism, but you were putting these basically at a five-foot maximum of space around the building, whereas you could go ten- or fifteen-foot space on the other hydraulic jacks. The support structure that you needed to span fifteen feet was a lot greater than what it is if you're spanning five feet. Here's the platform that you had the workers working on, putting the steel in and pouring the concrete into the forms. These pneumatic jacks, all this was was just a three-quarter-inch non-galvanized iron pipe, threaded so that it would connect onto the other as you kept going up. So it's pretty simple, a pretty simple mechanism that we were using.

In the picture you can see all the verticals. All those verticals is the slipform jack. They're pretty closely spaced together right there. It works well because you have door openings and ins and outs of walls and things like that. You need your fairly close spacing with that anyway. So that was the mechanism of getting back to what we were doing in Hawaii, that had never been used over there.

Adamson: And the timing of this was?

Law: Late sixties.

Adamson: So it was already perfected by this time of this one?

Law: I'm not positive. I wasn't at the company. I believe we were in the process of developing the pneumatic jack in the late sixties, but the use of slipforming for buildings was, I think, unheard of over in Hawaii, and developed the flying form over there. These are techniques that we had used successfully in the Bay Area quite a bit.

Our second project was Turk and Eddy Apartments that was using these techniques, and this was late 1963, early 1964 that we were putting the design together for that to do the project. This, I think, was being developed in the very early seventies, after like 1970, 1971, because it was something that was not brand-new but relatively new when I came around in 1974. We had used this on a couple of projects in San Jose in the late sixties and early seventies. So the techniques were developed. The whole concept of slipforming wasn't something that Charlie developed, but he refined it to the point where it worked better for the buildings that we were building, the type of use that we had for each of the projects. This was working better.

I think your question was how do we develop new markets. That was one of the ways we developed new markets, by coming in with new technical ideas that were different than the way people had done the projects in the past. We ended up being successful in those markets by doing that.



One interesting one, my personal experience with that, was back in Braintree where we were building the Braintree parking structure. We came into a market in Massachusetts that things were pretty normal. They had pretty conventional construction. We came in with an idea on this parking structure to build our precast columns, and since we had such a big garage, but we had no room around the site and every other bay we had to store dirt for the backfilling of the walls that we were doing, so we had limited areas where we were going to do the precasting of our columns. So we didn't have a large area to store these columns after they were cast, so we decided to store the columns in the vertical erected position.

But what we needed to do under that circumstance is since these were forty-foot-long columns, we had two columns on a casting bed, we essentially worked with the engineer and identified what the cracking strength, the cracking capacity of the column needed to be to pick this column up with one point, essentially pick it up right here in the vertical position and instead of putting it back down, we simply erected it and we put it in the spot where it was going to ultimately stay. But to be able to do that—we wanted to do this the next day—we determined that we needed 1800 psi concrete for the concrete to be able to stay together with the reinforcing that we had in it. We actually upsized the rebar a little bit. Using an engineering approach, we determined that 1800 psi would work if we got that amount in one day. So we increased the concrete strength a little bit and it was good concrete and good aggregate back in that area. Did some tests when we were pouring the footings. We did some special one-day tests on the cylinders and determined that we could consistently get over 1800. We were usually about 2200 psi on that concrete strength.

So we had the confidence to go ahead, and we ended up doing exactly that; pouring the concrete in one day in the afternoon. We were pouring these every day, pouring the concrete in the afternoon, and achieving overnight—we covered them over. It was during the summertime, too, when we were doing this. We got the 1800 psi, we picked the columns up and put them in place and erected—we had like 192 of these columns that we were putting up.

So we went through that operation pretty successfully. It ended up being one of our better historical costs for that. But what was really funny was, we would have salesmen or people from outside of the job would come, and our guys, our field crew, who had never done anything like this before—they'd worked—they had many years of experience in the Boston area, had never done anything like this before, and they were bragging to the people that came onto the job saying, "Well, look, we're erecting these things the next day. This is great."

And the people coming onto the job, "Nah, that's impossible. You can't be doing that." [laughs]

So it was pretty much pushing the envelope in areas—particularly areas we hadn't been in before, and developing a name in those areas and demonstrating competitiveness as well as innovation in every area that we went into. So that part was fun.

Adamson: That's great. So I have a question here. Many of the innovations you listed in your spreadsheet [provided to me before the interview] seem to be driven by a desire to reduce costs. Was that the main impetus or were there cases where improving the

functionality of the building or responding to regulatory requirements drove the innovations?

Law: For the most part, the innovations that we did were a function of cost. There were some in particular that we had an interest in developing the quality in the performance of the building. Probably the best example of that is the hybrid moment frame, using that system, because the purpose behind it was to develop a system that could essentially go back to its unaltered state after an earthquake.

Just stepping back a little bit, in structural steel and in conventional cast-in-place concrete design, the joint between the column and the beam is designed to fail, and that's what absorbs the load. That's what absorbs the earthquake kind of forces that want to destroy the building. In case of a cast-in-place concrete, the joint moves and the reinforcing holds the joint altogether. But in a severe earthquake, that joint tends to rupture, crack, concrete falls out, there's chunks that come out, and at the end of a major earthquake, that joint has to be replaced.

The same thing in structural steel. The structural steel has a very highly supported strength in column, and the beam that comes into it is actually designed to be weaker than the column. So as after the Northridge earthquake, that beam is designed—in fact, they cut out portions of the top and bottom flange—it's called a dog bone because that's kind of what it looks like when you look at it from the top—to make the beam weak enough so that in an earthquake that beam will bend and deform, but the column will stay intact so that the column doesn't fail. They're much more interested in having the one beam or a series of beams of the building deform and have to be repaired than to

destroy the column and let the whole building fall down. That's the purpose behind it. But in either way, those two systems are designed [to deform and] ultimately what happens after a big earthquake, the joints have to be replaced.

But the moment frame system is designed to [bend and not break]—it actually has a joint in it. It has something that will open and close with the bands of post-tensioning that's in between the column and the beam. During an earthquake, that beam opens and closes and there's reinforcing in the top and bottom that does not go out of its elastic limit, so that it does not have to be replaced [after the earthquake load]. But it can absorb—it's essentially a shock absorber where the opening and closing acts like the spring of a car. At the end of a pretty significant earthquake, that joint ends up closing to the point where all you have to do is just some cosmetic patching of the joint, but it doesn't have to be replaced like it does in other areas.

So that's a particular innovation that I think was originally intended to be a cost savings, and it has proven out as that, but it is also providing a much more durable connection for the seismic operation of the building. But for the most part, our innovations have been either for cost or schedule, and without sacrificing quality, the hybrid frame arrangement, that was a benefit or added quality.

Adamson: So picking up on the hybrid moment framing system, a March 2000 *Civil Engineering* article noted that this was not a proprietary technology.<sup>2</sup> Can this be said of the other innovations on your list, as far as what's out there and what's trade secrets?

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<sup>2</sup> Laurie A. Shuster, "Keeping It Together," *Civil Engineering* 70 (March 2000): 44–7.

Law: I wouldn't say that there's much in the way of trade secrets. The hybrid frame was developed through public money for the National Science Foundation and NIST [National Institute of Standards and Technology] and other public agencies, and so the use of that is essentially public. People in the public can use it.

The way that the ICBO [International Council of Building Officials] report is structured, we have an ICBO report which allows this to be used in buildings, which it has our name on it. So anybody [who] uses that ICBO report has to technically go through us, unless they do their own ICBO report. Essentially that's the way it's supposed to work. The only thing that might be trade secrets, and I don't know that it's necessarily that much of a trade secret, but there's techniques that we developed. When you develop a whole new technology like that, there's details that have to be worked out and worked through, and we've developed a number of those that make the system work better. There really isn't anything that we are doing that we feel that anyone else is not allowed to do, based on a patent. We'll have techniques that we know we've tried different ways of getting to a particular better technique, so we may keep that kind of quiet, but there's nothing preventing somebody from using the systems that we've developed over the years.

Adamson: What did Charlie Pankow see as his most important technical innovations personally?

Law: Well, that varied through the course of his career. Slipforming was an area that he was heavily promoting, not only in building construction, but he also developed this prior

to coming with Pankow or starting Pankow. He developed it for producing precast concrete pile that was used in the San Mateo Bridge construction. So, technical innovations were elements that he constantly went on to the next good technique.

One of the things that he ended up actually getting a patent on was the use of slipforming with building the air-conditioning shafts of buildings, extruding them along with the slipform, so it was a patent that the company personally took a heavy role in that. Many different innovations. Slipforming is one. Precasting was another. He was very interested in promoting precast in every aspect, even to the point where we developed our own portable concrete pre-stressing bed that we were able to take from job to job and cast the precast beams that were needed on the job, do them on site. When the job, when that was finished, or all the beams were stacked right on the job, we just picked the bed up in sections and moved it to the next job. That evolved ultimately to the creation of MidState Precast in Corcoran. Once we were able to get the individuals that had the expertise, we found that by putting a plant in the middle of the state, we were able to support precast in the Bay Area and in southern California. So, precasting is another area.

I think probably he would say his best innovation was probably the hybrid moment frame. That was so revolutionary. That wasn't really a refinement of other techniques that other people developed; this is a brand-new technology that did not exist prior to our company's and Charlie's promoting that. I would think that would be his greatest technical innovation.

Adamson: Is technical innovation what distinguishes Pankow from its competitors, or is it more the design-build approach, or is it both?

Law: Well, I think those certainly have a lot to do with it. Those are aspects that are mostly lost on clients. They're exciting to us, but when we start talking in terms of technical innovations and the design-build, you immediately see their eyes glazing over. It's not an area that they quite understand, so they're not necessarily looking to that. There are some that do understand it, and they jump on that and they get excited about it. But I think what distinguishes our company probably the greatest or what has been most successful for getting new work is making sure that the client is happy at the end of the job and making certain that we have solved every issue with the client and they know that we are probably a lot more proactive in solving problems than other contractors end up being, though they'll be looking to us to help them get the process going not only through the design process, but also through the construction process.

There's always going to be challenges on jobs, but we're going to step up and take care of those challenges and finish the project on budget and on time and leave them with something that is a something that everybody's happy with, and that's the only way that you get to be a repeat client is by consistently doing that. And once we've gone through the industry, particular areas, there's a lot of people talking about our company, other clients, and that's really where we sell our company is on the jobsite, by doing everything correct, doing everything to the owner's satisfaction. The owner's happy, and then they have this network, and, boy, if you get in the good side of the network, then

you're in really great shape. If you get in the bad side of the network, then you've got a real problem.

An interesting story was the regional manager for the mall in New York, we had a decent relationship through the course of the job, but the last three months of the job when we were getting ready to close out the job and finish it all up, he really got aloof and he was almost belligerent on everything that we were doing. Finally, nobody could figure out why he was being like that. Finally, Tom [Verti] came out to talk to him. "Look, Joe, what's going on? What's the problem? Things were going fine, but now you're jumping all over us for everything." It wasn't anything substantial that he was jumping on us.

"Oh, I'm just waiting for your giant change order to come in for the project," and he was absolutely convinced, based on the way that he had seen other contractors work for him on other jobs, he knew that things didn't work out perfectly and everything for us on that job.

And Tom told him, "Joe, there's not going to be any change order. This is it. Nothing's happening." I don't think Joe believed him the first time, then he told him again, and a couple weeks later he told him again. Finally, the job finished. There was no change order, and he was absolutely incredulous that the contractor, knowing that there was some issues, did not throw this giant change order at him at the end.

And this guy, this regional manager of a major company in New York, started marketing our company to other developers in the Long Island area, trying to get us to do some more work out there, because he was so impressed with what we did. I think that's what the developers and that's what people look to us when we're marketing new work.



They view that with a lot more interest than they do our technical innovations or design-build. They see those as techniques, and the fact that we do what we say we're going to do, that's what they look at.

Adamson: So that's part of the culture.

Law: It is, yes. It's a very important part of the culture.

Adamson: In September 2005, Bob Tener of the [Charles J. Pankow] Foundation stated that innovation was lacking in the construction industry.<sup>3</sup> It struck me at that late date he was saying that. I was wondering, could tell me what he meant by that assertion? Was this something that was Charlie's point of view throughout his career, that innovation was lacking in the industry?

Law: Charlie had that feeling that we were kind of pushing against the wind, and in many cases we were. I think to a large degree in the early stages, we were very successful because we were very different in that area. Innovation was a big change from what most people had seen. I think as time has evolved, the risk aversion that a lot of companies, their philosophies have taken on, they're continuing not to look to innovation to solve problems. In many cases, it's the construction management approach where all they've got is they're taking the projects for the absolute lowest fee and selling the client that this is a good deal for them because they'll beat up all the subs and make it so the

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<sup>3</sup> Kevin Smith, "Pankow Invests in Construction Research and Development," *San Gabriel Valley Tribune*, 7 September 2005.

subs make just a little bit of money. They'll take the lowest fee. They'll only put one person on the job. They're not going to manage any risk. Any risk has to go back to the owner, and they consider that a good deal for the owner. But there's absolutely no incentive for them to be innovative in that kind of an approach.

When you have a significant number of clients or contractors around the country doing that for their client, technical innovation just doesn't go very high on those construction managers' list. Plus the fact that as a construction manager who doesn't really do any of the work, all they're doing is just managing other people doing the work, they don't have the experience to know what you can innovate. It's like not having enough information to even know what questions to ask or what things to attack or what areas need innovation if you're not performing it. In our experience, being a contractor, a hands-on contractor that actually does significant amounts of self-performed work, all the way from the cast-in-place to the precast, producing a significant amount of the building with our own forces, we see the areas that could benefit from innovation, and we get the information and start using it and put it into a good mode.

Adamson: So construction management is still something that competes with design-build as an approach in the industry?

Law: Yes, it is. The problem that has gone out there is there's a number of construction managers who have taken on projects, calling themselves design-builders, technically design-build, what that is, is the design-builder then hires the architect, all the designers and does the contracting that way. When you have someone from a construction

management background who all they're looking for is either the guaranteed max or beating up of the sub and taking the lowest fee, when you go into design-build as a construction manager with that approach, with that mentality, which a number of them have done, design-build takes on a different role. It's not necessarily to solve problems. It's not necessarily to be the one entity that's totally responsible for the whole building, taking on the risk like that. When you start morphing design-build into that with that kind of approach, things fall through the cracks, owners are expecting one thing and getting another, always less than they're expecting, and that in some regards, when people have been doing that, it's given design-build a bad name.

The approach that we take, our flavor of design-build, which is what we feel is the right way to do it, is to solve all the issues and take care of the problems, approach it with the quality mentality that we've had in all of our other contracting mechanisms. There the client has been happy. But too many other people have gone the other way. The client has experienced design-build and it's not so good for them and saying, "Well, we're never going to do design-build again because it just didn't do what we were wanting it to do." So it's a case of getting down and ultimately doing things the proper way.

Adamson: So has that led the company to promote design-build in order to save its reputation or build its reputation?

Law: Well, build a reputation of design-build.

Adamson: Reputation of design-build, yes.

Law: In fact, we've been very active in the DBIA. In fact, Rik [Kunnath] was one of the founding members, Rik and Charlie, basically with some of the founding members of the Design-Build Institute of America. We've kept an active role in that for years and years and years, still involved in it. So it's trying to get the definition of that such that you have the benefits of design-build without the pitfalls of kind of construction management mentality.

Adamson: If you go back a decade or two or three, what sort of resistance did you have to overcome with owners in selling design-build?

Law: Well, when we first started using this approach, design-build really didn't have a reputation. It was a system that we thought looked like a good system. I don't even know that we called it design-build at the time. But over time, it evolved into the contracting method called design-build.

What we were looking for in the early stages, very early stages, was a way that the client could build their building after they had gone through the traditional approach of completing the plans, finishing all the plans, putting it out to ten contractors, getting the number back and the number was too high. Several of our early projects were, as I mentioned, salvage projects that then we took the approach, "Okay, well, let us come in, let us hire the designers, let us come up with the ideas that we can make changes to the building." I'm not sure we were calling it design-build at the time, but that's what we

were doing. And we ended up making a project for the builder, for the client, that ended up working for them, and they saw that we could do that. We did that with Winmar frequently, and Winmar could see the value of what was evolving into design-build and so they were very happy to work with us on that right from the very beginning and then let us hire the designers. It always seems to be easiest to sell when the client has taken the first approach to finish the design, put it out to bid, it doesn't work, now what do I do? And when we come in and, "Well, let's try the design-builder approach," we make a successful project, they embrace it, at least in that regard.

One of example of that—and I mentioned a couple projects that were in the mid-sixties when this was going on—just recently, in early probably 2002 is a project in Hollywood that had had that same approach [Sunset + Vine]. The project had been totally designed. The builders had been trying to figure out how to get it down to a particular price. That price didn't work for the client, and it languished for about five years until another client bought it.

We had worked a design-build with them on a smaller project, and they asked us to come in and do the same thing. Well, we came in and we basically cleaned house completely with all the designers that were on the project because they had their own idea how it was going to be successfully built. What we ended up doing, not changing the quality in any regard, but they had parking structure, two levels of parking below the entire retail footprint, and then had residential on top of all of that. Parking below the tower, below grade, below another use, is very expensive for cars. Typically it's not a revenue-producing portion of the job.

What we ended up doing was taking all the cars out from below the retail, putting it in its own separate structure next to it—the site was large enough to do this—its own separate structure and brought the cost of the parking—literally the cost per car for this was half of what it was for the parking below grade, because below-grade parking you can only get maybe 400 square feet to 450 square feet per car. At that particular case, it's about \$100 a square foot for the parking. Whereas if you are doing a stand-alone garage, you're down in around 300 square feet per car—so it's much less area per square foot [car stall], and the cost per square foot of that is about \$50 a square foot for the cars' [stalls]. So the cost per car is huge. We saved about 5 million dollars just in changing the parking configuration, doing nothing to the finishes of the structure. But that was enough to make a difference in the pro forma that allowed the project to go forward, and we built the project.<sup>4</sup>

They [Santa Monica-based Bond Capital] ended up selling the project and they made a huge amount of money. We came in on time, on budget and all that, but they made significantly more money on the job that we were able to make. But we were able to build the job and successfully for the client, so those are all good things.

[Begin track three]

Adamson: So, projects like that you just mentioned were how design-build built its reputation by just doing good work?

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<sup>4</sup> Greg Aragon, "The Next Act in the New Hollywood: Pankow Builders Completes Major Mixed-Use Project," *California Construction* (August 2004).

Law: By doing good work, coming up with value for the client, but most of the time it was—I guess in many cases on a new client, we couldn't really get their attention because they didn't know that they were going to have a problem. But when they actually did the full design and put it out to bid and the pricing came out too high, they realized they had a problem. So, we were there as the solution. Design-Build was used as a solution. And we've used that example to a lot of clients to tell them, "Look, this is a way to, I guess, preempt your having a problem," but it's a harder sell because they say, "Well, we're not going to have that problem," and they go forward the way that the rest of their community or at least their perceived community goes forward, which is the CM [construction management] approach of "We'll get the number down by beating up the subs and having a real low fee for the construction manager." That's not everybody, but to a large degree that's those people, how they start out and that's their feeling as to how the world works.

Adamson: Were there other competitors that used the term "design-build" or "design-construct" back in the sixties and seventies, or was Pankow out there on the vanguard?

Law: I think we were really using design-build before it was called that, because we were using those techniques. In the sixties and seventies, those were the times that I wasn't too aware of the marketing of other jobs. My focus was on the jobs that I was building.

Adamson: How did Charlie Pankow come to the approach? Was he—something on his mind before he started his own firm? Did he kind of learn it before?

Law: Well, when he was with Kiewit, he was in charge of the Building Division of Kiewit for southern California, so he had a venue to start that philosophy with Kiewit, and I'm sure that he saw that as an opportunity to start his own company. There were some projects where, as I recall, the American Cement Building, which is right at MacArthur Park in Los Angeles. They were very interested in doing something unique with their exterior. Charlie and the people that were working with Kiewit that ultimately came with Pankow, demonstrated that they were able to work with designers and the client to get what the client wanted. So I have a feeling that the idea of hiring designers and working directly with them evolved from projects that needed that, in early stages like that, and then it turned into an idea that ended up being pretty successful.

Adamson: Why has the design-build approach taken so long to gain acceptance?

Law: In my view, the large part is some contractors claiming that they're doing design-build, and it's not the same way, not the same method of design-build. I talked with a structural engineer in Indianapolis. He was a co-member of the advisory council when I was at Purdue [on the advisory council]. He's absolutely adamant against design-build, just would not have anything to do with it because he had some really bad experiences of people doing it in the way I mentioned it before, looking at it as a construction manager



approach, and I think they were calling it design-build GMAX, which doesn't really lend itself very well to that.

After I described the method that we ascribe to, the way that we view design-build, he said, "Boy, I'd like to try that kind of method, but as it's turning out, there's nobody there that's heading in that direction." So that's made it difficult. I'm sure that Rik or Kim Lum probably have even a better understanding since they're in the middle of that, relative to design, you know, DBIA. But those are some of the views that I've seen that different people have a problem with design-build.

Adamson: How do you apply design-build to a public building situation where its bids are required?

Law: Well, that's actually a contracting method that a lot of public agencies are doing, but what they're doing is bringing plans to a fairly complete level and then sending it out to design-builders, quote, unquote, design-builders, and telling them to, you know, "Finish the drawings and give us a price, and your price is not to have any change orders to it," trying to use it.

We view that more of a bridging document, a bridging approach, whereas all they're really doing is transferring the risk of the design process to the design-builder. We've gotten involved in one or two of those projects, and they're pretty challenging because the design-build works the best when you have control or a lot of say in the early stages, the very early stages of the project, when you can work with the massing of the

project. Like, as example, the parking structure that we took out from below the retail and moved it as its own entity—that made a huge difference.

In the public agencies, when they develop these what we call bridging documents, we really can't do that because they've advanced the design to a level that they want you to fall within the design that they have established, and then they'll put it out to competitive bid with a series of design-builders that will come up with pricing and then finish the drawings and build the project. That's an area of design-build we haven't really pushed to be a part of, although we will participate if the circumstances are right.

Adamson: In 1973 the General Services Administration administrator, Arthur Sampson, stated that construction was the worst managed industry in America.<sup>5</sup> Would Charlie Pankow have agreed with Sampson, and was design-build a way of addressing this deplorable state?

Law: Yes, I think Charlie definitely would have agreed with that, based on what he had seen, and he saw that statement, I believe, probably as more of an opportunity for our company than anything else, knowing that if we were able to manage the process better than the other person and develop a quality product in the end, we would have a leg up with our competitors. In fact, our tagline on our envelopes and our stationery, everything else, was "Construction through Cost Control." That's what we had in there that we were selling, and we were not only selling, but producing for the industry. So right there, I think, I don't know if that was a result of Sampson's comments or just they say, "All

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<sup>5</sup> "Change: The Building Team Is Getting Together for a Change," *Building Design & Construction* 14 (December 1973): 34.

right, we're there." [laughs] Whichever it was, I'm sure Charlie would have agreed with that and said, "Look, that's what the rest of the industry is, but we're different."

Adamson: So organizationally, how did Charlie make sure that the company wasn't taken on too much risk by using design-build as an approach? How do you as an estimator estimate without rolling the dice on the company? How can you be confident that you're going to be within—

Law: Well, that's kind of two different questions. I'll answer from the estimating perspective because it's an area we haven't talked about. In the estimate side, where we are able to manage a tremendous amount of risk and in the early, early stages of drawings, is the knowledge we have of how a building will go together and the database of not only labor productivity for putting a project together, but what components of the building ought to be, having built similar buildings, using an office building as an example. We know what the loads are per code. We've built many different office buildings. If they're looking for a standard building of 100 foot by 200 foot, which is kind of average, we know we can build this with precast beams and at 18 foot on center with this we can put a column every 18 foot, we put a beam in between the columns. Eighteen-foot span of a slab, a six-inch-thick concrete slab, will work, because it's worked time and time again. The amount of reinforcing steel is probably going to be about 3.8 pounds per square foot of that.

So, actually, with that information on a building like that, we can almost design the building and work with the structural engineer with just a couple of phone calls for

things that are different. Usually the footings and the lateral, the earthquake supporting forces are the things that are in question. Most of the other elements are pieces that we can envision as to what it's going to take to build the building, and then we envision those and we put it down on a fairly detailed estimate with labor productivity that we've had a lot of history on, and we know the nature of the building because they're all different.

But we know the nature if this is going to fall within certain ranges over productivity, and we're able to track that through, build the building in our heads, put it onto paper, and then get it into an estimate, and go out to the subcontractor market and get sub bids on the major elements like the exterior, the MEP, the drywall and elevators, and with that simple, you know, what I just mentioned, we're able to get probably 80 to 90 percent, in some cases, of the cost of the building and develop a budget for the owner that's going to hold through the course of design with that.

So it's only having had the experience of how the buildings go together, the experience of working with the designers to see what the elements want to be, that gives us the ability to build and estimate buildings in a fairly accurate method, and that's the mechanism that we use that I give to all of our estimators. For a company of our size, we only have seven people dedicated to estimating, including myself. We really don't have any estimating managers, even though that I'm a manager as well as an estimator, because I've never stopped doing these estimates. Every one of our estimators do the same thing. I make sure that I'm giving them the example that I want them to follow, and we don't have somebody who's just a manager that doesn't know how to estimate. We

need to keep that level of understanding current with everybody that's doing it in every one of our offices.

That attitude really stems from Charlie. He was heavily involved in estimating in every aspect of what he did through the course of his whole career. Made my job sometimes kind of challenging, because he had a lot of ideas of how he wanted to see things done, and he was usually right. But it made me grow into someone, I think, that can handle things maybe a little differently than you'd find in other companies, and that's what I'm, right now, imparting to the people that will take on those roles as I move on, type of thing. That will be a while, but that's the whole approach.

Adamson: You make it sound like this isn't, because you say you're working with the designers as you go along, but is it ever the case where there's tension or resistance between balancing the cost versus what the designers want the building to look like?

Law: It's not so much the structural engineers, because we kind of understand what their needs are, but architects are ones that will [almost] always design more than what the owner can afford, so they have their vision of what the building wants to be, and in almost every case we come along and put reality to real costs to what their vision is, and the owner tells us they can't afford it. So, okay, where do we go from here? We become the messenger that just delivers the bad news, but then we start working and seeing what we can do. The first thing we look at is creating more efficient structures and things like this so that the work, remodeling, remassing portions of the building so that it does work within the pro forma, like in the Hollywood example of moving the garage outside of the

building. But there's always a challenge and there's always working through the process to get the budgets in line with what the client can afford. I don't think we've ever started a project that the number was under the budget that the owner was carrying.

Adamson: Is that right?

Law: Yeah. But that's the nature of the process, you know. You go through the process and then you get those elements into the building that are essential both functionally and architecturally, functionally and form-wise, and you make the process work. I think there have been a number of buildings that we've worked on that we've constructed, like this one right here [points to photo on wall]. This building right here we were able to work, doing a lot of working with the architect.

Adamson: And that's what building?

Law: This is Shoreline Square project in Long Beach. The architect wanted a lot of different looks to the architectural precast, which we produced off-site, and we were able to work with the architect using the molds that we had. In some cases, we made a completely different [looking] panel by turning it upside down and combining it with another mold, not adding the mold cost, but making a different-looking panel by playing around with it a little bit and saving money in the form material, but achieving what the architect was looking for in his design in ways that are a little more creative than you'd normally find. And you can only do this because we were making the precast. We were

buying the molds; we were pouring the concrete; we were trucking them to the job and erecting them, and knowing that this is what we could do, we could work with them.

That ends up being a fun collaboration with them. When the architect is of the mind that the contractor or, in our case, our company has something to offer them, and they view us as kind of a team member as opposed to, you know, a pain in the butt, somebody's who's just giving them bad news and cost information that they don't want to hear, but somebody that's working with them to see, "Okay, well, let's see what we can do to do what we need for the aesthetics of the building, but still keep the costs within what the owner can use in his pro forma." Those collaborative efforts are probably the most enjoyable, even though there's challenges. But it's working through and solving those challenges that make our job, I think, valuable to the owner and a lot more fun to do as we go through the process.

Adamson: That's great. Is it ever the case where once you've saved all this money, the architect sees the opportunity to add back something?

Law: Oh, yeah. Oh, yeah. We call it asking them to break their pencil, saying, "Look, let's stop the design and let's get [finished]." The mentality of an architect is very different than it is for the contractor. That's their role. Their role is to evolve this building from just something with no shape at all to something that has a shape, and I think just the whole nature of architecture is, that's their job is to continue to evolve up until the very end, and our job is to, "Look, we've got to stop at this and we've got to start building. There's got to be a point in time when we've got to build something, as

opposed to evolve the form into what you're looking." So, yeah, there's always that issue of getting them to finish their design and let's move forward.

Adamson: I can appreciate that. What is this term "value engineering"? Is that a recent term? How does Pankow apply it?

Law: Value engineering is what the industry calls changing the design to reduce cost. That's usually what it ends up being, creating more value for the project. Sometimes a lot of architects will call it devalue engineering, because most people, all they know what to do is just to reduce the finishes. You've got stone everywhere, well, let's put ceramic tile. Or you've got tile, let's go to vinyl wall covering or something like that. They view that, and quite rightly so, they see that as devalue engineering, because you're taking value out of the project to save cost. That's what typically the industry looks at it, and we try and get away from the term "value engineering" while we're in the early design stages, because value engineering is something that is done after it's been designed and then you've got to change it. We look to be proactive prior to that and essentially get all the value into the design before it comes through the process that has to be pulled out, as opposed to put back in.

The process that we have to do that is we're working with them, the client, at an early, early stage, some very conceptual drawings. What we'll really work towards is getting the most efficient structure, which most the architect and the client really don't care what it looks like. They want it to stand up, they want it to be per code, and they want it to have good longevity and that sort of thing. But if we can get the best efficiency



in the structure, that gives the architect and the client a little more latitude in the finishes, which is really what they're most interested in. So in many cases, when the designer has no constraints with the client, they'll put everything that they want into the project and then ultimately something has to be removed, and that's what they term value engineering.

What we're working with at the early stage is every step of the way, seeing the direction that the architect is going, constantly reporting back to the owner what this decision is going to do to your budget and letting them know and say, "Okay, well, the budget has now gone up a half a million dollars because you've added this level of finish beyond what was there before. Do you want to do that?" And having them be able to make the decisions before it really gets too heavily ensconced in the drawings, so that we're able to keep the budget in line and not get to the end of the design process and send it out to bid and find out that you can't build it because you won't be able to afford it, try and get that information to the client a lot sooner, let them make decisions and say, "Well, if we can't do this, if we do this, this will be \$200,000, not \$500,000." And that fit within the budget and it would be almost the same. So that's how we view value engineering. We look at it the step before value engineering is what we really work to do.

Adamson: That's interesting. In the summary of Pankow's innovations that you gave me, you referenced meeting, quote, "the challenge of an unskilled labor market," unquote, in the 1960s, and then the, quote, "challenge of reduced labor productivity

around New York City,” unquote, in the 1990s as motivating factors behind innovation, I’m assuming. Can you elaborate on those two?

Law: Well, those, I think, were quotes on specific examples, specific projects, and I think the first one—was that on the one in Louisville, Kentucky? I think that what we did in Louisville, Kentucky, was, again, for Winmar Company. It would have been the floor plank.

Adamson: The 1990s one was the Roosevelt.

Law: Right, right, that’s a different—

Adamson: Let me see what the 1960s one was.

Law: Yes. The first quote about—

Adamson: Unskilled labor market.

Law: —unskilled labor market, that was the mechanization of the slipforming technique. In building the particular walls that were in the projects that we were looking at, there’s a fair amount of skill required to actually form the walls and the columns. In the slipforming mechanism, you have a small number of skilled people building the forms, but then relatively unskilled laborers simply pouring the concrete and then a few skilled

people that are actually raising the form and making sure that the form is going up straight. So just like the assembly line technique created mechanization and improvements in using unskilled labor and giving them the skills necessary, but not the full amount of skills necessary to build the buildings, it's a method of using mechanization for putting the building up with people that don't have to know every aspect of how to construct a building. They're able to essentially use their skills, learn a limited skill on an assembly line kind of mechanism to raise the building up and finish it like that.

The other example of the challenges of productivity in New York, what we developed there was a deck form that could incorporate precast beams which we produced in kind of a factory atmosphere in a building across the way from the mall, produced the beams, trucked them over to the jobsite, erected them. So now we have beams in the air. We then developed a deck system that could be handled with forklifts so that there was relatively few workers that actually had to raise or put the formwork in and then pour the concrete and then strip the forms out.

The other method was handling a lot of pieces and plywood, separate sheets of plywood, having larger number of skilled people required to do the work, and we were able to train and get some of the better workers and make them more productive, because we needed fewer of them due to the mechanization of the deck form that we developed for that particular job. We've used it on two other office buildings. There it was used on a parking structure. We used it on two office buildings after that.

So those are some of the innovations that met the challenges that we encountered. Both of it was really going through the unskilled labor force versus the unproductive

labor force, not too dissimilar, but using mechanization to solve the problems in both cases.

Adamson: So what is the best way of understanding Charlie Pankow's and the firm's contributions to civil engineering, generally?

Law: Well, I think there's a lot that goes through a lot of different areas. Technology, there's some developments that would not have occurred without our getting involved, like the hybrid moment frame. Slipforming may have been developed by other people in the early stages, but the advancements of going from hydraulic to pneumatic jacks, that was an area that civil engineering, the construction industry, was helped considerably.

The concrete industry, a very large amount of our involvement has been working with American Concrete Institute [ACI]. Charlie was president of the Institute in 1980. Dean Stephan, I believe, it must have been, like in '85, I'm thinking some few years after that, and then just recently Tom Verti was the president of the industry [institute]. In each of those times that they were president, they brought and introduced, in a lot of cases, the concrete construction—I won't say mentality, but attitude to what had almost been exclusively the engineering design side. So there were, I think, elements within the ACI group that have been approved by some of the methods and ideas that those three gentlemen brought to ACI.

Design-build, I think, essentially we were doing design-build before it was called that. We found it to be a successful way of creating projects when they were basically stagnated, because they couldn't work for the client. I'd like to think that the work that

we're doing right now, the quality of work that we're doing is having a big impact on the construction industry. I know that there's a lot of us involved, and my personal involvement in industrial advisory councils throughout the country, working to help the curricula in different universities, to have those improved and be more attuned to the needs of the construction industry, the design and the construction industry, giving ideas to them so that they can take those back and develop their curriculum to develop students that will then come out and be employees of different companies. I was on the advisory council at Purdue, and they [we] have other people on other advisory councils at other universities.

So I think there's an interest in giving back to the industry in that regard, ACI, and we're also helping individuals at Habitat for Humanity in certain areas, both in volunteering with their time building, but also in kind of the management of some of the things that they're doing, a little bit in the design, helping them through areas that they don't have the expertise, giving them ideas, introducing them to the new suppliers and putting the soft touch on the suppliers to have them donate to Habitat, things like that. So there's a lot of areas, I think, that we've been able to improve the industry. I know that we're constantly looking for more to do improvements wherever we can.

Adamson: Are there any of the innovations on your list that you sent me that you haven't discussed that you want to elaborate on?

Law: We've talked about a lot of these.

Adamson: Right.

Law: I think the information that you have, that's probably just pretty well outlined right here, where this thirty-two-story office building in Louisville was originally in steel, the owner couldn't afford it, and Charlie came in and redesigned it in precast concrete and slipform core and saved, like I say here, in today's dollars, like 12 million dollars for the client to do that, something that wasn't going to work, and made it work.

We talked a lot about most of these. Yes, I think maybe this just gives a sense that we actively look to use products that improve the techniques and methods that improve the techniques and techniques that improve the design and the construction process that we have through here.

Adamson: Finally, organizationally, I've worked in software companies where there's engineers who want to just be engineers, and there's engineers who want to be managers. How does it work within Pankow? You had mentioned that most people you recruit are engineers. How do you identify who's going to be the managers and then the top managers? How does that work?

Law: Well, there's a lot of opportunities within the organization, and people basically, I think, develop and demonstrate skills in certain areas, and they're then given more responsibility in those areas, and they kind of move in one area as relative to management or stay in a certain area that they're comfortable in. I think most of the individuals who stay with the company are ones that ultimately end up as managers. Those that do not,

sometimes will go to another company. But we've been able to attract and retain some very competent, bright individuals with innovative ideas.

One of the biggest elements, though, you can have that in someone who wants to do everything for themselves, and those are the individuals that generally leave sooner rather than later. Probably the biggest attribute that everybody has is the interest and willingness and ability to work within teams, working as a team, working for the benefit of the company as opposed to the glory of the individual. Those people that have stayed with the company and have done the best are those that approached the career here that way. Because we do some pretty interesting things and I think we retain the individuals who can get around the idea of doing absolutely spectacular things without drawing attention to ourselves, and that almost completely epitomizes the personality of Charlie, it really does, because he was doing absolutely spectacular things. But if you start talking about him and his accomplishments, he would work it around to describe the benefits and the accomplishments of the company. He would never leave it to the point where it was what he did. He would always leave it as to what the company had done. I think that has been ingrained pretty heavily in our corporate culture, and we have a group of people that are very sharp, very highly motivated, and also very highly team oriented.

We've also hired people from outside of the company in some higher-level positions, and they're absolutely amazed and thoroughly delighted as to the people they are working with. They enjoy that whole atmosphere, because you don't have people that are out for themselves. You have people that are looking to benefit the team, benefit the company, and they find that very refreshing from what they had experienced on their previous job.

It's probably a good way to conclude, because that's really what Charlie—he led by example in this particular area and he stayed very quiet about himself, but was very vocal about the company.

Adamson: Even as the company got bigger, this way of mentoring and nurturing innovation was pretty much driven from Charlie?

Law: Yeah. Yeah. Since he's gone, he gave us the tools to really look for that and pretty much instilled in us the attitude that we need to promote for teamwork and the good of the company, as opposed to the glory of the individual. So it's up to us now to continue that and get that message to all the people that will follow us.

Adamson: I thank you for your time.

Law: Well, certainly. This has been fun.

[End of interview]