



## **Oral History of Kenneth G. “Ken” Sletten**

Interviewed by:  
Duane Wadsworth

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**Duane Wadsworth:** We'd like to welcome Ken Sletten to the Computer History Museum, today. This interview is a little bit of a different oral history in that normally we talk about things on silicon and all sorts of other things relating to the information age. Today we're going to talk about bricks and mortar, because I think we all realize how the buildings or edifices in which we work affect what we do. And Ken Sletten is the [co-]founder of the leading construction company in Silicon Valley that built most of the famous early buildings that housed the semiconductor industry and latter on people [and companies] like Netscape and others with which that we are familiar. Welcome, Ken, to the Computer History Museum.

**Kenneth G. "Ken" Sletten:** Thank you, pleasure to be here.

**Wadsworth:** We're going to start right from the beginning. I know you're not a native Californian. Why don't you tell us where you were born and what it was like growing up there.

**Sletten:** I'm unusual in that I was born in Helena, Montana, and not too many people there. My dad worked for the telephone company. And we moved from Helena when I was five years old, and I was brought up then in Billings, Montana. I went through school there, and it was a very nice place to grow up. However, when the time came to leave I was more than ready to find out what was going on in the rest of the world. At that point the biggest city I had seen was Billings.

**Wadsworth:** So you decided after high school, go to college someplace else?

**Sletten:** Right. Well, I actually got into the University of Colorado on a NROTC scholarship, I guess you'd call it, where they paid my books, fees, tuition and \$50 a month, and I found that wonderful. I just had to give them my summers and three years after I got out of school.

**Wadsworth:** What degree did you get from Colorado?

**Sletten:** I got a [Bachelor of Science] degree in civil engineering with kind of minor in the Navy and the Marine Corps.

**Wadsworth:** Why did you choose civil engineering?

**Sletten:** I just kind of knew that I liked it. I did a lot of different jobs when I was in high school, and even before that, almost all of them had something to do with construction, although, not the pretty part. I dug ditches for the city water company, and I worked in a warehouse that did construction supplies. I worked for The Bureau of Reclamation surveying in Buffalo, Wyoming the last summer of my high school. I knew

that I liked to be outside, and I liked mathematics, too, as a matter of fact, so it seemed right for me, and I knew it right from the beginning.

**Wadsworth:** And how many years were you in the military?

**Sletten:** Three years.

**Wadsworth:** But you took the option with the Marine Corps?

**Sletten:** Well, it was a Navy scholarship, but of course the Marine Corps is part of the naval establishment, and I felt I just liked the Marine Corps better than the Navy, that's all.

**Wadsworth:** It's the most macho.

**Sletten:** I applied to the Marine Corps and they accepted the change from Navy to Marine Corps when I was a sophomore.

**Wadsworth:** And how long and where did you serve?

**Sletten:** Well, first of all I served in the summers. It was interesting in that one summer we went to Hawaii and up and down the West Coast. Another summer we went to Little Creek, Virginia and Pensacola, Florida, and another summer, I went to Quantico, Virginia, and that got me through college. When I graduated I went back to Quantico where they have what's kind of a boot camp for Second Lieutenants. We all graduated as Second Lieutenants in the Marine Corps, the regular Marine Corps. So that was five months called Special Basic School, and it was not as tough as boot camp, but it was plenty—they had captains, so they could really boss you around as platoon commanders. When I got out of college they sent me to the West Coast and I spent a year at Oceanside, California, and when that was over I actually applied to go to Korea. I don't know why I did such a foolish thing, but I did. Anyhow, it was a short stay in Korea. I got there in Christmas of, I guess it must have been '53, and I had an assignment to recover some bodies of Marines who had gotten stuck in the Han River. And on the way to do that job we got attacked with some [Chinese] mortar shells and I was unlucky enough to get hit by one of them. That was interesting in that I ended up being picked up by a helicopter and taken back a few hills, and there was the set of MASH, identical, really, the green tents, and doctors, and it was a slow day, so I had—well, I was pretty well banged up. And from there, after a few days, I went out on a hospital ship, the USS Hope, and then back to Yokosuka, Japan, and they did a few things for me. Then I went by air, of course, to Mare Island and there was a Naval Hospital there at that point. It's gone now. And I spent a year in the hospital. I had a bunch of things that had to be done end to end, and that's how long it took. It wasn't so unpleasant, but it did take a little time.

**Wadsworth:** What would be the biggest take away from your military years that you think applied to your career that was about to evolve here in Silicon Valley?

**Sletten:** Well, actually, the year I spent on the West Coast I was [a 2<sup>nd</sup> Lieutenant] in a Shore Party Battalion—everybody in the Marine Corps is in the infantry, but then they have some specialties. Because I was a civil engineer that's where they put me, and it was very interesting. Among other things, we landed on Oceanside Beach with a big invasion, and it was really a kick because we came in with wave after wave, and there was no real danger, so everybody pretended to be war like. But the interesting thing is, we landed on the beach and everybody dug in and firing blanks and so forth, and maneuvering, and then when we got right up to Highway 101 down there somebody blew a big whistle, and that was times out, and we all went under the freeway through a couple of places there, then relined all up, they blew the whistle and on went war. So it was really fun except they captured some troops that were disguised as wetbacks, and there was a lot of radio back and forth about that, but they wouldn't give us any information. We found out they really were wetbacks, and these poor guys were terrified of the whole thing. We let them go, of course, at the end.

**Wadsworth:** So you were playing war games that maybe honed your skills to deal with the...

**Sletten:** Well, yes. We had a lot of heavy equipment, and explosives, and so forth, and so I learned a lot about building bridges, temporary bridges and so forth. So it was time well spent as far as that's concerned.

**Wadsworth:** But when you were out of the military you made a very important decision to go to graduate school.

**Sletten:** Well, I did. While I was in the hospital, I met a Navy Commander who was a submarine executive officer. We got to be pretty good friends and he went down and signed up for Stanford Business School. He had it all prearranged, and he asked me if I was interested. If I was I should come down, stay with him and go to class with him a few days. So I did that, and I thought, "Wow, this is perfect." I had already decided this was the place I wanted to live, the Bay Area, and so I applied, and I guess they felt they couldn't turn down a wounded Marine, so I got in.

**Wadsworth:** What year was this that you started Stanford Business School?

**Sletten:** It was 1954. It was a two-year program. Actually, I went to summer school and graduated a quarter early, because I was in a hurry to kind of get started.

**Wadsworth:** When you got your MBA were you looking at different places to apply it, or with the construction industry as a target?

**Sletten:** It was several things. One of them was that I knew I'd been telling myself, "I want to be in business for myself," and here was an opportunity. Back in Colorado they had a combined degree, five years, it was business and engineering, but the Navy wouldn't let me take that because they wanted me out in four years, so then it just kind of fit in. I thought, "Boy that would be good. I'd meet some people and get to know the business in Silicon Valley," although, it wasn't [called] that then. I was pretty sure it was a good thing to do, and in retrospect, I think it was a good thing to do.

**Wadsworth:** Did you interview many companies for your first job out of business school?

**Sletten:** That's a good question; not too many. Well, I met quite a few, actually. I got to interview Steve Bechtel, because this one friend I met in the hospital knew Steve. He was his roommate in college. I was offered a job by them. I was offered probably ten different jobs. Every job I applied for I got an offer.

**Wadsworth:** Well, you must have looked good on paper, good experience, plus an MBA from Stanford.

**Sletten:** Yes, well, they just seemed to love that. I don't know if they do as much today as they did then, but they just loved the idea of an engineering degree, and especially some military in between, and then a business degree.

**Wadsworth:** So what was your first job, then?

**Sletten:** My first job I eventually picked was a construction company that was medium sized called Williams and Burrows. They were in Belmont, and that seemed just perfect. It was a size of company that I could imagine myself getting to that size someday. Others were Bechtel, and Morrison Knudsen, and some others that were really big companies, and I took one look at them and I thought, "There's no way I'm going to get to—I don't even want to do this because they have everybody going out to Timbuktu someplace where there's nothing going on," and I was still a bachelor. I didn't really want that, so.

**Wadsworth:** Do you remember what your starting salary was in 1956?

**Sletten:** I think I had the lowest starting salary in the business school class. I was so eager to get going. I told the man I interviewed with that I didn't really care what he paid me as long as I could be out in the field, because I actually had a pension because of my injuries, and I wasn't too worried about money.

Well, he took advantage of that, I think, but the good news was I got lots of raises after I got started, so [it worked out].

**Wadsworth:** That's funny, because we all know the starting salaries out of Stanford Business School are all six figures now.

**Sletten:** Oh, gosh. Mine was a couple hundred dollars a week or something. It was awful.

**Wadsworth:** How many years did you stay with Williams and Burrows?

**Sletten:** Five going on six years, and it turned out Mr. Burrows was a great guy. I really liked him. He was a lawyer and a civil engineer, and he really liked me, and so I got some really nice experience, different kinds of jobs within their realm, and I couldn't have asked anything better. It was terrific.

**Wadsworth:** The combination of a civil engineering undergraduate degree and an MBA from Stanford, were there other MBAs in Williams and Burrows?

**Sletten:** No, no. There was one other guy that was an engineer, but not an MBA. In those days, actually, the interesting thing was that almost none of the general building contractors had engineers; most of the people that were leaders were superintendents that grew up in the trade and probably didn't go to college [but that didn't keep them from being smart and good leaders].

**Wadsworth:** So that was a difference with you right there in the beginning. Did Williams and Burrows have any, at the time, tech companies for which they had developed buildings?

**Sletten:** I'm trying to think. Well, one of the jobs that I ended up on was for [five buildings at] Sandia [also, Atomic Energy Commission] out in Livermore, and that's a high tech company in a way in research and so forth. What else? I had a wide range. I did a job at Cal, but it was for the music department. It was a very interesting ornate building, two buildings, really. [I also worked on a secret underground building for Lawrence Livermore Labs with seven foot thick concrete walls and a large hydraulic operated lead door.]

**Wadsworth:** Construction is a big world, obviously, and you could have been building shopping malls or whatever, but what was it that both at your first job and then later that got you into this interest and specialization in companies in say, the semiconductor field?

**Sletten:** That's another good question. Well, when we first started, Onslow "Rudy" Rudolph, my partner and I, he had a degree from San Jose State in civil engineering, and our first customers were people like Lockheed, Ames, Sylvania, Fairchild, [HP, and NASA]. There was a lot of that kind of work going on, and it was just the kind of work we wanted then: fast turnover work. It made sense making that dollar really work. And so we remodeled an awful lot of stuff, and all the little electronic companies starting were started in a warehouse, most of them, and then we went in and put a bunch of wood frame in there, and a mezzanine, and a few things, and they would do their thing, and then hopefully they'd call us back when they got a little bigger. And we made sure that they did call us back because we did a great job.

**Wadsworth:** The architects must have picked up on the fact that you folks were good at doing high tech, right? I mean, there were special needs in those days of clean rooms and DI water and all of that, so how did you get in to be experts in those fields above your peers in the industry?

**Sletten:** Well, first of all, for me and for Rudy too, we were fascinated by all this stuff going on and we were pretty much quick learners. We just asked a lot of questions. Fairchild was a good example. They were doing all kinds of interesting things, and early on they had an architect engineer. He was an engineer and an architect named Jim Stratta [of Simpson, Stratta & Associates], and we did a couple very interesting jobs. We built their first plating lab, which was 30 feet in the ground, and used gold as one of their chemicals that they made the chips from, and it was all liquid deposition [gaseous, today] where they'd dip it into a tank and take it over and rinse it, and then rinse it again, and then another tank etc. And then we built the largest de-ionized (DI) water plant west of the Mississippi, we were told by our client. So we learned. We just learned by doing, and being sure that we understood exactly what went into that job, and as engineers, that's the way we think, anyhow.

**Wadsworth:** But no one seemed to capture the amount of, I mean, hundreds and hundreds of these buildings of the high-tech companies that you did. The word must have spread that these guys know how to build plating operations, then DI water and all of that.

**Sletten:** That's right. Okay, it was doubly that way. We attached ourselves. There were two architects that did the most of this kind of work, and they specialized in it, so we followed those guys around. The other one was Ehrlich, Heft and Rominger. You may have heard of them, but they, locally here, were very good at that kind of stuff. And one other thing, we presented ourselves as businessmen and not just contractors, businessmen engineers and not just contractors, and we wore suit and ties to talk to our clients, and they'd treat us with a little more respect, I think, because of that.

**Wadsworth:** I gather, in this period of time now that you were, of course, with Rudolph and Sletten that your numbers increased in employees, as you ended up with almost 1,000 employees and sales of a billion dollars. Obviously, that's quite an accomplishment over a number of years, but that's not a small company.

**Sletten:** No. It ended up not being a small company. Another thing I think that happened there was that an awful lot of contractors really weren't very interested in high tech. They were nervous about it. [The owners were always in an incredible hurry.] It was a place where you could get in trouble, and where the plans weren't complete when they were building them. I think they were afraid of it a little bit. I know some of them were definitely afraid of it, but we didn't have any problem at all. It was really fun for us.

**Wadsworth:** In the early days, how much contact did you have with some of the founders of the company like Bill Hewlett and Dave and Packard, and the Fairchild guys, and the Intel? Some of these early luminaries certainly must have had some contact with you in the early buildings too.

**Sletten:** Yes, we had some contacts. I'd say Hewlett and Packard were maybe the closest ones that we—back working for Williams and Burroughs we built three buildings, Rudy and I together built three buildings for Hewlett Packard. And, in fact, one of them was where Hewlett and Packard had their offices, and so we did their offices, so we got to know them. We thought at the time that Hewlett Packard was a little further along than a lot of these companies, and that they were a very well managed company. We put extra special effort on Hewlett Packard work. We would do any size job, any time of day. Just tell us when, we'll be there. We got to know Dave Packard a lot better, because later he chose us to build the Monterey Bay Aquarium, and that was high tech in many ways.

**Wadsworth:** It certainly was. It's an incredible place.

**Sletten:** And it was really a labor of love. It was really fun to do that. We found Mr. Packard was a wonderful man. He was very stern. When anything went wrong, and it was our fault, why, he'd let us know about it, but I enjoyed that.

**Wadsworth:** Were there any special challenges with waste disposal because of the chemicals and gases and so forth that were used in these companies, including Hewlett Packard in the early days? Some of that was uncharted territory, wasn't it, with city codes and all? Do you have any interesting stories there?

**Sletten:** Well, yes. Gosh, we did one job for a company called Electronic Arrays, and they were a small company, and I think they remained small. Somebody must have bought them or something, but we put in an underground system to collect the waste from their process, and it was lined with this special epoxy, and we had pipes that were acid resistant and so forth. And we thought we were doing everything just right, and several years later we remodeled the same building for somebody else and we looked at that system, and we dug up the pipe, and the pipe had no bottom in it. It was just completely eroded, and it was the best technology everybody knew at that time. People had gone to a lot of trouble to specify those things, and we worked very carefully to get it done right. But there was more of that, as you know. Fairchild had some trouble, all though, not with the building we built as far as I know. The plating facility, I think that was all right, but they got in trouble with another building called the rust bucket.

**Wadsworth:** Did you build the rust bucket? That was the big one on Ellis Street.

**Sletten:** No. We didn't build that one, thank goodness. That was a lot of trouble, and there were a lot of chemicals in the end. That was really a Super Site, I think.

**Wadsworth:** I believe that is true. Of course, it's been torn down since then. Was there any well-known building that, from your point of view, was an unmitigated disaster for Rudolph Sletten?

**Sletten:** A job that we did?

**Wadsworth:** Yes.

**Sletten:** Well, financially the worst one we did was a church. It was an Episcopal Church at Waverly and Hamilton in Palo Alto, and it's still there, but we were low bidder, but maybe just a little too low. That was quite a revelation, as a matter of fact. As far as any kind of thing with waste or anything like that we never really had any problem. We had a structural failure. We had a subcontractor to do some forming work for us, and he'd left out, I think inadvertently, but he left one of the shores, and so that's about the worst thing that happened to us. By the next morning we had it all formed up and ready to pour again. But everybody had some kind of things like that. We had another one where we had a low break on the concrete and, again, we had to remove some footings and put it back in again, but nothing really serious, knock on wood.

**Wadsworth:** The clean room is very important part of Silicon Valley history, because semiconductors could not be made without the clean room. Can you tell us the evolution of clean room and how you participated in the evolutions of clean rooms, because they just got better, and better, and better?

**Sletten:** Yes, they did. Gosh, we built so many of them, and they kept changing the class until it got less than one it started out at 100,000, then down to 10,000 and they gradually filtered out the larger particles to allow the line-width to make smaller chips and this allowed the chips to be smaller.] We went all the way from, "Let's see," to building for Xerox and their PARC Group. We built [them] a Class 10,000 [room]. We thought that was really the avant-garde and it was for a little while. And we ended up building what they called a "super-clean room." And we were instructed to build the best clean room in the world, and that's what we attempted to do, and as far as I know we did. We went to Japan and attended some lectures from the Japanese on what they were doing. They were quite open about it. They had a scientist named Dr. Omi who was known as the best clean room expert in the world, so then all kinds of clean rooms in between. That one was, I think, less than a class one compared with a class 100,000. So what we did is just try like heck to learn as much as we could about the process, what was happening, what the dangers were to the client. And I remember it was for Trilogy, Gene Amdahl had started a second company. We told every—we had 18 different gases coming into the plant from the shed on the

outside, and all of them were either explosive or extremely toxic [or flammable]. I know there were three things. Anyhow, explosive, toxic, well, and so we had to really be careful. I mean, it was all stainless steel piping [which is very difficult to clean and weld]. It's so complicated, and you had to have really good workmen, and really good supervision, and your people had to wear bunny suits at the end of the process, and it was kind of interesting. If you wanted to talk to somebody that was inside the clean area you had to have a radio to talk to them, because you couldn't go in there. It took 20 minutes to get in and 20 minutes to get out again.

**Wadsworth:** It has been said that a very small container of arsine, for example, could take out the whole city Palo Alto. It's amazing to me that in the history with all the bad gases and things, that there's never been a serious accident, to my knowledge, in large Silicon Valley in the semiconductor industry. That's true, isn't it?

**Sletten:** It is true as far as I know, yes. Flammable was the other thing I was trying to think of, yes.

**Wadsworth:** Flammable. There are some nasty things out there, but I guess they've been very important, but that does go back to the care with which things were built. Of the semiconductor companies, in particular, who were the easiest to get along with, and who were the most difficult or demanding?

**Sletten:** The most difficult was Intel, I think. I'm sorry to have to say that, but they were tough to deal with. We'd have to have, I don't know, maybe a dozen engineers on their jobs. We did a job they called D2P2. That was an expansion of an existing clean room to a new size wafer. I think it was an eight-inch wafer at the time. I think they had just put out a book. Andy Grove wrote *Management by Confrontation*, and they followed that. For instance, if they asked us to price a change order they would say, "And I want you to come back with three solutions to the problem by tomorrow morning priced out, and we will choose the one." Well, I mean, that's just almost impossible [on a fast track job]. We had people staying up all night quite often. And, of course, they're a very successful company, and they did a wonderful job, but they didn't make it easy on their suppliers.

**Wadsworth:** How about AMD?

**Sletten:** AMD was different. They were easier to deal with, and I'm not sure what that means, but. And on that job we had a kind of unique approach. It was where they gave us a whole floor. It was a basement floor of one of their buildings right next to the new building, and so all the subs, everybody had an office [key] down there, so it was wonderful, really, as far as communication. You could just walk over to the electrical department's desk there and work something out, come back and do this. So in that way the [electrical subs] were kind of easier to deal with. We thought it was a big plum because our

competition was a couple of the really big contractors in the world, and we somehow won that. There was a big celebration in our company when that happened.

**Wadsworth:** You did some early Fairchild things, too, before Intel, right? I mean you mentioned the plating and so forth.

**Sletten:** Yes, the plating and the water. [Also] we were doing smaller jobs all the time at Fairchild. We were one of [four or five bidders]. They had several other contractors they took bids from, and so we would bid the individual jobs. I can't think of any principal things like the plating lab, because that was the guts of the whole thing at that time. And the DI water plant, they used a lot of DI water, and they were planning on using a lot more. There was a guy named Hogan, right?

**Wadsworth:** Well, Les Hogan came from Motorola.

**Sletten:** Yes, I remember that.

**Wadsworth:** And he was president of Fairchild.

**Sletten:** That kind of changed things. I don't think it was quite as copasetic around there with Hogan being there, but I don't know if it was his doing or what.

**Wadsworth:** I think it's acknowledged that the company took on a different character when Hogan came from Motorola, Phoenix.

**Sletten:** Yes. No, we loved working over there, because they always had a lot of stuff going on, and we were just down the street in a way. They were on Whisman, and we were on Shoreline Boulevard [then Steirlin Road], and so we could be there fast.

**Wadsworth:** Well, you've certainly seen a lot of changes in the Valley.

**Sletten:** Oh, I'll say.

**Wadsworth:** From the very beginning, and looking down you have a list of hundreds of buildings and projects you did, and it reads like a chronology of the evolution of Silicon Valley from the early days of semiconductors to the Internet and so forth today.

**Sletten:** Right.

**Wadsworth:** Looking back on a long career, and everything else like that, can you give us just a couple of your most memorable moments. You've dealt with some pioneer companies, and some pioneer people.

**Sletten:** Well, let's see. I didn't get to talk to the head guys too often, but I did if I could. We did electronics, but we [also] did an awful lot of science buildings for Stanford, for instance. We did more of that kind of work than any other contractor during that 30 years that we were pretty much on the campus all the time. One of them was The Center for Molecular and Genetic Medicine, which had a little of everything in there. Two Nobel Prize winners went in there. I got to meet them. That was interesting. And let's see, what else would be—well, I went to a lot of groundbreaking ceremonies, and I met briefly many people who had a shovel in one hand and shook mine with the other.

**Wadsworth:** What was your biggest dollar project?

**Sletten:** Well, the dollars have changed a lot, too, so it's a little hard to say. The biggest leap forward that we had, now that I think about it, is Memorex; was a company we started when they were tiny, and we built a building for them, and then we built a small office structure, four-story, for them, and then we built a whole campus for them all at once. It was 50 acres close to—what was it, San Tomas and Scott.

**Wadsworth:** Right. That was the "building on the hill."

**Sletten:** The building on the hill. There were three manufacturing buildings and then this. Well, I can't remember the number of square feet, and then an office building on top of a hill that we kind of built right there. And it was really an innovation as far as our company like that, and that would include electronics as well. The campus structure really worked. And it was the first one in the country as far as I know. And it had seven pages in *Architectural Record* when it came out. Leland King was the architect, and Jim Stratta was the engineer. But that was the thrill. That was the thrill.

**Wadsworth:** That's funny, because I knew a couple of people that worked there. It's the antithesis of the Hewlett and Packard in a garage and all these other companies starting out humbly. When Memorex started it was just one big splash. There wasn't any garage business or anything with them, isn't that correct?

**Sletten:** That's right. It didn't go through that phase at all. They started out and built a building for themselves with another contractor, and then saw the wisdom of their ways and hired us from then on.

**Wadsworth:** But that was a real change, and of course that seems to be the way it is nowadays with venture capital. The garage days are over. Some people may start in their back office or something, but in general if there's money they're in business.

**Sletten:** In those days nobody had that kind of money, and people started just in the corner of a warehouse. Our first office was the back half of a broom warehouse on Terra Bella. And one of the biggest thrills we had there—one of first times we got a million dollar check from somebody we brought it to the office there, and everybody got to hold it for a little while, and we took pictures.

**Wadsworth:** This is personal question, which you may or may not want to answer. Did you, with your knowledge of what you saw happening with these companies when they started to use any of that information for your own personal investments?

**Sletten:** Well, yes. I did. I did, and I did pretty well by it. I told people my system, and nobody really followed me. But what I found was like Hewlett Packard being an example, but Gilead and Genentech, and those, I know are pharmaceutical more based. If they had a well-managed field operation, if they had a good guy to handle the construction, and my observation was, "This is a well run place and everybody seems to be of high character and smart. Then I'm going to buy a little stock," and Memorex was the first one. I did that. I was able to get some founder's stock and it turned out that was just perfect. Well, it went on to other ones. I never lost money with my system.

**Wadsworth:** Well, that's good.

**Sletten:** Except on the Trilogy job I did a little bit because Gene Amdahl and his CFO brought us in, Rudy and I both, and he said, "Well, we're ready to start the job now, and I guess the contract's all been settled." He says, "Gene and I," this was the CFO, "Gene and I would like to see you two investing in the company." Well, anyhow, I said, "How much?" And he said, "Well, \$50,000 or \$100,000, \$50,000 each," is what he said. I said, "Well, gosh, I'm really sorry, but our board of directors will not allow us to take our working cash and invest it, because it's not good business for us, and I know they'll say no." And he said, "Ken, you don't get it," he said, "I want you, Ken Sletten, to invest \$50,000 of your money in the company and, Rudy, I want you too," so we did. We did, and then it turned out that Amdahl went broke with that. I don't know if he went broke, but anyhow, it failed, and we ended up with our \$50,000 we each salvaged \$2,000 on the investment. We didn't make it. I mean, that's all that was left. We lost \$48,000 each. So, anyhow, that was my worst experience now that I think about it.

**Wadsworth:** Well, it didn't exactly put you in the bread line.

**Sletten:** No, no. It wasn't that bad. It wasn't that bad. Well, there's a happy ending to the story. I forgot. DEC bought that building that we built, and at that time that building cost \$25 million dollars [to build]. I

remember it. And so DEC bought it, and they did the logical thing. They hired us to fix it, and to outfit it for their purpose. And so we did, and the interesting thing is it cost \$25 million dollars before we got done, so it was not a complete loss.

**Wadsworth:** You got your money back.

**Sletten:** Yes, we got some of it back.

**Wadsworth:** I think that's interesting. What else would you like to add to the record as far as the contributions you made? You told me that when you were watching that PBS program on *American Experience: Silicon Valley* that you realized how much you really had participated in so many of these companies that have made history here.

**Sletten:** Yes, that's right. I think, every firm, I think less one that they mentioned, we had worked for, every single one. I thought, "My, gosh, maybe we had a bigger part in this than I thought." But I don't know any other contractor that specialized in doing tough jobs. I mean, we wanted intricate tough jobs that take good people and smart people to do it. So then we got into hospitals, and there's a lot of electronics in hospitals, too, systems and so forth. And we got into biotech because biotech, again, is a very complicated kind of construction. But electronics has remained the basis of our thrust.

**Wadsworth:** What about one of the things on that program that was pointed out? I guess it was at Fairchild, and certainly Intel later, there was a new concept in office space with the cubicles and so forth, and that probably came from architects, but one of the questions raised about that was relating to noise. Did you deal with any of those issues when the new office plans came in?

**Sletten:** Well, we did. We built the world headquarters for Hewlett Packard, and they had their rigid specs. They wanted a hundred foot candles at table height for light, and they wanted a certain kind of tile on the floor, but they wanted it light colored so it would be light inside. Oh, they had a bunch of stuff like that. Anyhow, so we turned over that space, and the first thing I came over there one day and it looked like the lights were all out, and I figured—and still there were people at their desks and so forth. So I asked. I said, "How come the lights are out," and he said, "Well, it's just too damn reflective. They can't see their screens on the computers because of all of the light reflected off." And so they had to re-outfit that. I mean, that was probably the biggest dollar impact about the offices and so forth. As far as sound goes I don't think the cubicles helped much at all. Now we're building buildings with open space and eliminated the cubicles pretty much [altogether]. [Now they mostly] have workstations. Where my office is right now it's built that way and it's very pleasant, and it isn't very noisy, because people kind of respect each other. Inside of a cubicle they think they're in a room and they're shouting on the telephone, and it just goes over the top into the next guy's space. It wasn't really very effective.

**Wadsworth:** One thing we haven't mentioned, that is important in California, earthquakes. When you talk about these diffusion furnaces, and all the other equipment in semiconductor companies, were there special things you had to learn and practice relating to building to California earthquake standards, which changed, I would gather, over your time in business.

**Sletten:** Boy, I'll say, yes, definitely. There for a long time every three years the building code changed in the state and then almost all cities would adopt the new code. The changes were all based, really, on the earthquake, one that happened. And I remember the [1971] one that was in North Hollywood. Do you remember that one? The Olive View Medical Center had severe damage in that one, and it had been built according to a code originally, but that changed building codes tremendously right that particular quake. Then there was another one, the '89 quake that happened here, and that it seems like these quakes—on the '89 quake, for instance, we had just finished a job for Hewlett Packard up on Deer Creek Road, and it had these big eight by eight tube cross braces between the columns and so forth on the outside of the building. And those things looked like spaghetti when that thing [quake] was over. It rocked back and forth and they broke at the connection at the floor. Some of them broke right in the middle, or they just became kind of twisted. And this was kind of scary, but nobody got hurt [so the earthquake design did its job]. There was quite a bit of damage because it ripped to sunder a big eight inch or 12-inch fire sprinkler line and water went everywhere. That's what did the most damage. We went back and replaced all those cross braces. Nowadays, we just finished a job in Sacramento where those same cross braces now it looks like they redesigned the shock absorber in a car, and it's down in the middle there someplace. And so that when the thing starts rocking back and forth it squishes against this big shock absorber. And I've seen that two or three times. Another favorite thing that's beginning to happen in this country, [in] Japan it's a lot more prevalent, is the base isolation system. I guess you've heard of that, or have you not? Well, base isolation system is very clever in that I've seen it done on existing buildings. And they jack the whole building up. And they redo all the footings, make them a little bigger. And they put a big steel dish in more than five inches thick, shaped like a dish about three feet [or more] and three feet, and they refix up the bottom of the column on the upside. And then they lower the building down. Now, the building is setting on a hundred, say, of these dishes, and when the ground shakes the building, because of inertia, stays right there. The earth moves under it. It can move in any direction. The building will tend to slide back into the center of those dishes. So that's a base isolation system. The forces of the earthquake are much less then, because it never gets [directly] to the building. The Mills Hospital in San Mateo is built brand new that way using that system. Well then look at the stadium at Cal. That stadium cost three times as much as Stanford Stadium because of the earthquake requirements. And I, personally, think that maybe it was overdone, but I don't know for sure about it.

**Wadsworth:** Well, that's because you're a Stanford man and you're not a Cal man.

**Sletten:** Well, that's true. That's true.

**Wadsworth:** One of the differences [from other construction companies] is as a company you became a rather large company and had a lot of graduate engineers on staff. Did you, first of all, recruit people, because the construction industry might not be their first thought of where they might want to go as a graduate engineer, and secondly did you have any in-company education forces to keep them current with technology? How did that work with all these graduate engineers you had, which is a decided difference from most construction companies.

**Sletten:** Yes, well, first of all we recruited in about four or five different colleges, and we'd hire depending on the need, but on average maybe a dozen, 14 or something, engineers every year. And we gradually, because of our bent toward this complicated kind of construction, especially, when you realize a high tech building over 50 percent of the cost is electrical and mechanical, over 50 percent! Now, if you're a general contractor everybody knows you know how to build things out of wood and concrete. We would tell our new graduates, "You don't know anything about what we do. You've got a good background. For the next five years we've got a program that you're going to have to accede to," and so they all were very happy to hear that. And it was a really smart thing for us to do, because how can you supervise somebody when you know very little about what he's doing. You can't, really. It's just a joke. You're more like a traffic cop if you don't know what's going on. [We had and have today a rigorous training program to fill the gaps and especially in electrical and mechanical and construction for all our supervisors. To meet the requirements of Silicon Valley companies we have over the years originated techniques such as fast track scheduling, rolling schedules, zero punch list, #1 safety program in California, "Fly specking" etc.] So anyhow, it stood us in great stead. And another [thing] that happened we didn't really think about, and that was that some of those young people are going to get the idea that they can go in business too.

**Wadsworth:** Oh yes. That's the spirit of Silicon Valley.

**Sletten:** Yes, right.

**Wadsworth:** Sid that happen often?

**Sletten:** And so we'd try to talk them out of it, but an awful lot of them have. I'm on the board of about three of them, maybe four, and I love all these people. I'm really proud that they are able to go out and do the job. In the very beginning I was hurt by it. When one of those guys would leave I would feel forsaken. I hated it, but I got more philosophical as time went on.

**Wadsworth:** Well, the spirit around here is in general is you wish them well, because that's [the] same sort of spirit that you typically had when you started the business.

Sletten: Sure. I'm sure Shockley wasn't happy when all his people [the "Traitorous Eight"]...

**Wadsworth:** When you hired these young out of college engineering students, and then they got involved with your company, often times the reality isn't what they thought it might be. Was your turnover rate acceptable with these engineering students?

**Sletten:** I think in looking at the whole program I think it was very good. Some of them we kind of mutually agreed that it wasn't right for them, and they didn't really like it, and maybe they wanted to go back to Oregon anyhow. And so we learned—I don't want to say anything against Stanford. We learned that Stanford's master's program didn't really fit our company even though it's a great program. But Bechtel really loved that program, and they gave a lot more money to it than we did. So that was another possibility. We picked San Luis Obispo and Purdue, of all places, and UC Davis. Probably our most successes come from those three schools getting people ready to go to work, but their aspirations aren't way up here [in the sky]. They don't want my job in five years like some of these guys. No, the program has just been wonderful, and we've gotten to getting interns between the junior and senior year. We have them come on a trial basis and work for a summer. We can look at them and they can look at us. We got some really good people that way.

**Wadsworth:** Why don't we wrap this up with your thoughts on looking back over a long and very, very successful career? If you could do it over again, what, if any, would you change?

**Sletten:** Well, I wouldn't change too much, I guess. I really enjoyed it. It's been a lot of fun. I'm kind of a workaholic, and I like to see progress. I guess if I was going to do it over again I would want to attack today's problems, which there's a lot of stuff that's going on today. For instance, all of this thing about platinum LEED [Leadership in Energy and Environmental Design] construction, all kinds of green construction, solar is coming back, the new way of building office buildings, new ideas on seismic. I suppose we would just train those new engineers and ourselves in how to build a really good building that way. Well, another option it would be easy to get to be a nationwide company, and I personally never really wanted to do that. It gets too many layers of supervision between me and what's going on, and I don't think I'd like that. But California is bigger than a lot of countries, so. And California we're in San Diego, Irvine, Sacramento and here on the peninsula, and we can cover things pretty well.

**Wadsworth:** Thank you very much for talking with us today. I think your place in history of the technology of this great State of California, and especially here in Silicon Valley, is very secure.

**Sletten:** Thank you. It was a pleasure.

END OF INTERVIEW