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Interview with Skanska Project Executive Lawrence Damore

Q: What is your role on the project?

LD: I am the project executive for Skanska USA, the design-builder for the Gold Line Bridge. As the project executive, I am responsible for overseeing the design and construction teams, including AECOM, our engineering and architecture subcontractor.

I have a very experienced on-site team that includes a superintendent, project engineers, a quality assurance and control management unit, and others. Together we have managed more than a dozen subcontractors and well over 100 trades workers who have put in more than 80,000 work-hours on the project since site preparation began in April 2011. We are extremely proud that in that time we have been able to maintain a clean safety record with no recordable incidents.

Q: What is Skanska's history locally?

HB: With the merger of Yeager and Skanska in 2002, our company has worked in California since 1919. During that time, we have literally paved the freeways and infrastructure that supported the growth of southern California and the Inland Empire. Today, Skanska is a full-service construction firm serving every corner of the state. Skanska USA Civil, the division responsible for the Gold Line Bridge project, remains a fixture in highway, bridge and infrastructure work statewide, and has more recently entered the transit arena in northern and southern California.

Q: You have built many bridges in your career. What made this project unique?

LD: It is always challenging to build over an active freeway. What made this project even more challenging was the small footprint for our working area and of course the unique design. In addition to the Construction Authority, Caltrans and Metro had to review and approve the design for the bridge. Each agency had their own requirements and standards to take into consideration, and each had more stringent standards in response to the bridge location over an active fault.

The architectural elements were also quite unique. It was something very different for my team to tackle. The design required the construction team to implement the architectural elements through their craftsmanship. All of the details seen on the exterior of the superstructure and crossbeams, for instance, required crew members to install formliners one piece at a time by hand. Those formliners had to be placed correctly to create the desired results. They did an outstanding job, and I am very proud of the results.

We understand the importance of this bridge as a landmark work of art, so we wanted to be sensitive to protecting the structure in every way. Since a bridge of this kind can be susceptible to taggers, for instance, we are in the process of applying a permanent coating that allows graffiti removal without damaging the surface.

Q: What advantages did you find working with Andrew Leicester, the project's design concept advisor from the very start of the project? What was involved in those early planning meetings?

LD: Andrew understood the constructability issues. Our team, especially our architect, worked collaboratively with him to address the numerous constructability issues. He listened to the concerns and made innovative changes. There were occasions when it became apparent his exact vision couldn't be realized. For instance, on the exterior girders there were modifications that were made to allow the construction to be more practical.

Q: What were some of the specific criteria from Caltrans and Metro that created changes to the original design concept? How did the design change to meet those criteria?

LD: In response to the opportunities offered by a design/build contract, we proposed lengthening the spans of the bridge and reducing the number of columns and foundations. Initially, Andrew's design concept envisioned five columns, three in the center median and two on the southern shoulder. However, as we worked through our design we realized we could offer a more efficient structure. Just three columns would be sufficient with each one founded on an 11' diameter concrete pile reaching 110' deep into the ground. Regarding the baskets, where Andrew had envisioned four very tall, relatively narrow baskets and columns, the end result was very different—two shorter, wider baskets.

Andrew envisioned the superstructure as a rounded shape. However, we saw difficulties in the design and constructability of that form. We proposed a cross section with a flat soffit—the bottom of the bridge—which Andrew found to be an acceptable option.

As I stated earlier, Andrew was understanding of the constructability issues and continued to come up with creative and innovative solutions to work through these challenges.

Q: How did your team accommodate the existing condition of building over the Raymond Fault? Please explain the "smart column" technology built into the bridge's deep foundations.

LD: Every component of the design was driven by the seismic criteria. Designers start out by determining optimum span lengths. From there, column and abutment design can proceed. Finally foundations supporting those columns and abutment are designed. The columns had to be founded on single large diameter CIDH (Cast-in Drill Hole) piles which represent significant design challenges especially with seismic considerations.

Within the large diameter piles we have embedded sensitive coaxial cables. After a significant earthquake, a monitoring device can be attached to the ends of these wires to determine if any significant bending took place below the ground level of the pile. Without this system, a working crew would have to excavate up to 20' below the ground level to inspect for any obvious signs of concrete cracking.

We believe that this is the first time this TDR system (Time Domain Reflectometer) has been incorporated into a reinforced concrete bridge.

Q: Did the curved underside of the bridge present any specific challenges?

LD: The making of the serpentine soffit shape began with the building of the temporary falsework which supported all of our forms and eventually the concrete. The forms for the curved exterior were fabricated off site and hoisted into place. The ribbed look was obtained by installing rubber pieces known as formliners onto the curved forms. The cross-hatching was created by nailing small pieces of wood called chamfer to the form. Accomplishing these architectural elements required specially-designed forms and formliners. Nearly everything on this project was specially designed and manufactured for the project and required our crews to install them using detailed craftsmanship unlike any bridge I have been involved with to date.

Q: Can you tell us a bit about your team's response to the unique degree of craftsmanship, as well as their experience working with the new materials and forms?

LD: Our crews did an outstanding job in properly installing the forms and formliners to ensure the highest degree of quality and craftsmanship in the structure itself. Each form and formliner was installed individually and with great attention to detail. This was necessary to get the shape of the structure, as well as the grooves and hatch-marks, to line up and create the overall affect desired by the Construction Authority. I think they are very proud of their work on this bridge and how their efforts have created something truly unique and quite beautiful.

One key was also finding the right company to create and install the baskets. Skanska brought on a masonry contractor, Masonry Concepts, to perform that work. They, in turn, hired a pre-cast company called Moonlight Molds to actually cast the baskets and the reeds above the baskets. There are 120 basket pieces that were brought out to the site and very carefully set in place by crews from Masonry Concepts.

Q: What are you most proud of regarding this process and the outcome so far?

LD: The thing I'm most proud of is having put together a team that could actually get the job done. Starting with the design engineers at AECOM, and then our various subcontractors, and then finally getting our men on board to build it – they all did a terrific job. We ultimately want to recognize the guys that are out there. It's incredibly tough working outdoors, especially this past summer when temperatures reached well over 100 degrees. Add in the dangers of working adjacent to and above live freeway traffic and dealing with the noise and dust. Ultimately, I think they are all very proud of their work, and I am very proud of the collaboration and teamwork that made it happen.

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