

# Customer Case Study: Klorman Construction



## By Standardizing on Prolog® Software Integrated with BIM, Klorman Construction has Increased Efficiencies to Save over 8,000 Man Hours a Year on Every Project

Klorman Construction is a California-based design-build general contractor and structural concrete contracting company with more than 200 employees, annual revenues of approximately US\$150M and offices in Los Angeles, San Diego and San Francisco. Founded in 1980, Klorman delivers a wide range of construction services, including design-build, construction management, structural concrete, consulting, Virtual Design and Construction (VDC)/Building Information Modeling (BIM) services, value engineering, renovation and project management. The company has earned a reputation as a high-quality builder of complex parking structures, multi-level towers and high-end architectural concrete projects.

Klorman has completed hundreds of projects for clients in the airport, railway, transportation and parking, educational, institutional, medical, multi-family, retail and government markets. The company has received several awards over the years, including the 1997 Best Concrete Project in California award from McGraw-Hill/F.W. Dodge. Klorman placed Runner Up in the Overall BIM category at Tekla's 2011 North America BIM Awards, a program that recognizes projects in which Tekla Structures software has played a significant role and multiple parties have collaborated using BIM to benefit project delivery. More recently, Klorman was inducted into the Meridian Systems Hall of Fame that recognizes project-based organizations that are best-in-class when it comes to managing infrastructure-intensive capital building programs and construction projects.

Bill Klorman started Klorman Construction in 1980 when he was just 18 years old. As a young business owner, Klorman faced significant challenges. "To sell our services back then," he recalls, "we had to do higher quality work than the competition, and deliver it faster and cheaper than anyone else." An early adopter of construction-specific software, Klorman recognized how these emerging tools could help his company grow. "Technology was a great accelerator for my business because it gave me the ability to do more with less effort and fewer people."

In the mid-1990s, after evaluating several project management systems and having already been a user of computerized project management systems since 1982, Klorman purchased Prolog Manager from Meridian Systems, creating a centralized database for all project-related information and standardizing the company's project management processes on the program. "We realized that, to become an efficient builder, we needed to standardize our workflow across all projects," he says. "With Prolog Manager, we achieved standardization, along with greater accountability and better communication."

Klorman uses nearly every capability available in Prolog Manager, from Document Management and Field Administration to Cost Control, Procurement and Executive Dashboard reporting, and the system is used by corporate executives, project management, field operations, VDC engineering, facilities and plant management and accounting staff. "The budget controls and document tracking are big features for us," Klorman says. "And the Prolog Manager query engine is phenomenal. We query our central database every day to respond to questions, validate costs and defend time extension requests."

**"Due to the efficiencies achieved with our Prolog system, we have been able to reduce the size of our project teams by an average of four people. On the low side, that's a savings of 8,300 man hours per project per year."**

*Bill Klorman, President/CEO  
Klorman Construction*

## Integrating Prolog Software with BIM

In 2005, Klorman officially deployed BIM on all of its projects and soon thereafter adopted Tekla Structures BIM software as another standardized project management tool and set out to leverage the full capabilities of 3-D design technology. “We originally brought BIM into the field as a constructability tool, building a database while we developed our capabilities,” Klorman explains. “Now, using BIM to produce takeoff quantities for a new project is changing the world for our estimating department.” Klorman is currently using Trimble’s Robotic Total Station (RTS) technology with Tekla Structures, which has cut their field layout time in half.

When Meridian released Prolog Converge, a flexible Web-based application that improves collaboration, shares a database with Prolog Manager and is built on a powerful Web services platform, Klorman recognized the power of this new application and added it to his company’s Prolog solution. “Prolog Converge gave us the ability to link our intelligent BIM models to our projects in Prolog Manager,” he says, “which gave us a huge communication and cost control boost.”

## Capturing and Streamlining RFIs and PCOs

Klorman is using Prolog Converge to streamline the management of requests-for-information (RFIs) and potential change orders (PCOs). For example, the company’s VDC engineers can create an RFI in Prolog Manager that links to the BIM model and sends an automatic e-mail notification to the appropriate contacts via Prolog Converge. A link in the e-mail notification launches Prolog Converge, where the model can be viewed and the RFI can be answered. At the same time, a corresponding PCO can be generated in Prolog Manager.

“If an issue affects the model, it’s probably going to have a cost impact. So when we write an RFI, we tend to open a PCO,” Klorman says, using a recent public work project to illustrate the value of using Prolog software with BIM to document questions, answers and changes. “When we got this particular project, we were told it was 100 percent designed. But 2,600 RFIs later, we determined that the design was only about 40 percent complete. Because we captured every interaction in our Prolog software and BIM model, we were able to get the owner to understand and validate our added costs.”

## Significant Savings through Increased Efficiencies

Although Klorman continues to work with Meridian, Trimble and Tekla to find additional ways to automate their operations, the company’s Prolog solution currently delivers big benefits. “The industry is very brutal right now and inefficiency can be the kiss of death for a contractor. By taking advantage of technologies like Prolog Manager and Prolog Converge, our material quantities are leaner and our productivity rates are faster because we can track, control and predict what we do on a project,” Klorman states. “As a result, our start-up and close-out times are faster, too. And all of these things result in a major reduction in man hours on a project, which becomes a huge cost savings.”

How much savings is Klorman talking about? To answer that question, he recently reviewed historical project data in Prolog Manager. “A typical job for us usually runs between 12 and 18 months,” he explains. “Due to the efficiencies achieved with our Prolog system, we have been able to reduce the size of our project teams by an average of four people. On the low side, that’s a savings of 8,300 man hours per project per year.”

But the savings don’t just benefit Klorman. When estimating a project, the company leverages their reduced labor needs to submit bids that are often US\$160K or more less than their competitors. “Technology helps us deliver a quality project at lower cost, which provides a direct savings to the owner,” Klorman states.

## Project Management Becomes Controllable and Predictable

Klorman attributes much of the company’s efficiencies to the standardization provided by their Prolog solution. “Standardization allows us to switch people from job to job,” he says. “This helps us achieve a lower price point because we can move our staff around as needed, without a full-time, one-to-one project commitment. A project manager that used to manage a single job can now oversee three jobs: one in start-up, one in close-out and one that’s halfway complete. Since all projects are managed the same way in our Prolog software, the transition from job to job is seamless.”

According to Klorman, having a standardized and centralized project management system like Prolog

Manager that supports collaboration through Prolog Converge and links to the project model in BIM makes construction controllable and predictable. Instead of managing by exception, and reacting to problems on the job, the company can be proactive because they can see weeks into the future. "Predictability reduces our exposure while allowing us to grow the business by taking advantage of market trends."

### **Document Management Mitigates Risk**

Klorman's Prolog solution also mitigates risk by delivering the documentation needed when faced with a dispute. "Dispute resolution always comes down to who can produce the best information the fastest," Klorman says. "If you get into a dispute situation, you won't be in a good position if it takes you three weeks to generate a response. But if you can generate a response in less than 24 hours, like we can with Prolog Manager, that owner other party will be at a substantially lesser position and less likely to see merit in proceeding with a costly battle. "

Case in point: On a project with a large number of PCOs, the owner called a meeting to discuss the changes and requested Klorman's PCO logs. Klorman's project manager wrote a query in Prolog Manager and, in less than two hours, generated a document with 459 PCOs complete with description, days of impact, dollar value and links to supporting documentation. "There's no way we could have done that if we were keeping PCO logs in a spreadsheet. Prolog Manager gives us instant access to information, and that speed ensures profitability."

### **Controlling Costs to Stay Competitive**

As a technology-driven business owner, Klorman can recite countless examples of how the company's Prolog software helps save time, improve communication, reduce risk and, perhaps most importantly, control costs. "By merging project management tools from Meridian Systems with Tekla's BIM application and Trimble's Robotic Stations," he concludes, "we have achieved accelerated cost control, which will help us remain competitive as the industry changes."



## Klorman Construction Project Profile

### LAX Tom Bradley International Terminal located in Los Angeles, CA

The Los Angeles International Airport (LAX) is the 6th busiest airport in the world. To accommodate future air travel needs, the airport is undergoing a massive modernization effort that includes construction of a new Tom Bradley International Terminal. The terminal, which will expand the current space by more than 1M square feet, is one of the most ambitious airport projects in the country. The 7-story building has a composite structural concrete and structural steel design and features architectural concrete towers that are approximately 90 feet tall. Klorman Construction, which is contributing to the endeavor in multiple ways, is the project's Prime Structural Concrete Contractor and one of the project BIM leaders.

#### Key Project Elements

- › Demolition of the current concourse
- › Construction of a new 7-story, 665,000 sq ft terminal
- › A baggage-level footprint of roughly 158,000 sq ft
- › Construction of 14 new gates
- › New shops, restaurants, ticketing counters, security checkpoints and baggage areas

**Project Cost:** US\$1.5B

**Project Owner:** Los Angeles World Airports

**Architect of Record:** Fentress Architects

**Structural Engineer of Record:** John A. Martin & Associates

**Construction Manager:** Walsh Austin Joint Venture

**Scheduled Completion Date:** December 12, 2012

**Anticipated Results:** Building a new international terminal in the middle of one of the world's busiest airports while remaining fully operational is no small challenge. Yet, while the project is still a year away from completion, it has already received recognition. Klorman submitted the Tom Bradley International Terminal project to Tekla's 2011 North America BIM Awards where it placed Runner Up in the Overall BIM category. When complete, the new terminal will have the capacity to accommodate the next generation of super-sized jumbo jets, including the Airbus A380 and the Boeing 787 Dreamliner.



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