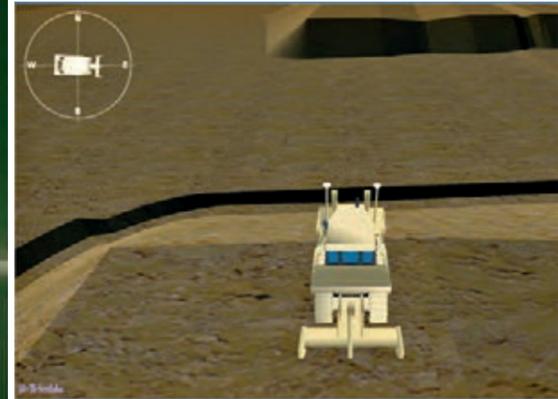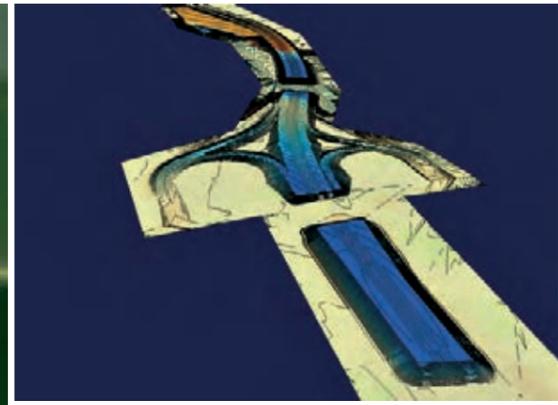# Highway 78, Brawley Bypass

Brawley, California, United States

Skanska USA West Civil California District was awarded the Highway 78, Brawley Bypass CALTRANS, project on April 7, 2008, with a contract value of USD 68 million (EUR 53 million). Being a CALTRANS pilot project implementing machine guidance grading, this was a unique opportunity for both owner and contractor.

Highway 78, Brawley Bypass	
Location	Brawley, Southern California
Highway length	3 miles (5km)
Client	CALTRANS
Contract value	USD 68 million (EUR 53 million)

The state worked very closely with the contractors, even supplying CAD's pre-bid, which is not a typical practice for this department of transportation. So the project team saw this as a perfect opportunity to use BIM from a pre-bid level through construction. A 3-D BIM model that the takeoff department in Riverside, California, created with Agtek was used to check early quantities and design logistics. This helped in staging, balancing materials and constructing the state appointed temporary construction easements – before anyone from the management team set foot on the site.

The management team sat with CALTRANS at the pre-construction meetings to assess and review any contract specifications, tolerance and practices. This ensured both parties were in accordance and it helped minimize conflicts further down the road.

Skanska USA Civil West California District has been using machine guidance as the BIM frontline since 2005, and successes with the technology gave the team's input validity for this particular site.

Post award the team had to make sure the client's 3-D data was usable to create a machine guidance model. So a BIM model with higher standard was created, but kept to the information supplied in the master design that was provided by the client. The final 3-D BIM model was used to check intersections, vertical curves and grade breaks in the office before it went to the field. When the model was sufficient, the 3-D BIM model was transferred to the machine control systems with a variety of different software.

The second goal was site control. For the 3-D BIM model to work for quantities and machine guidance, the team had the site plane match the client's with upmost accuracy. There was no margin for error here and Skanska made that very clear from the beginning.

The 3-D BIM model was used in all construction phases. The model, loaded on the motor graders, was used in prepping the road bed's foundation treatments and roadway structural sections and finishing grading of the sub-base surfaces. CAT D9 dozers with machine guidance were used to build and complete fill-slope work and embankments, and field personnel used handheld GPS (Rover) to check quantities and set and check grades all loaded with the 3-D BIM model.

Highway 78, Brawley, was an excellent use of BIM with emphasis on 3-D modeling, quantity takeoff and machine guidance. Using the technology, the team was able to complete the job with fewer errors, greater efficiency and reduced labor costs.