

## ***Leica Total Stations Used in Construction of High Speed Railway***



### ***High Speed Train Tracks Between Cologne and Frankfurt, Germany***

By the end of 2002, the 219 km (136 miles) long train tracks designed for speeds of up to 300 km/h (186 mph) will be completed, thereby drastically reducing travel time between Cologne and Frankfurt, Germany. The demand is enormous: 18 bridges, 30 tunnels and 3 medium sized mountain ranges have to be traversed. The estimated total cost is 7–10 billion Deutsche Marks (\$3–4.5 billion U.S.)

#### ***Ballastless structures—firm tracks***

Conventional ballasted track construction requires that

tracks and sleepers are “floated” on flexible (crushed rock) ballasts. With “firm tracks” the entire superstructure is made of concrete and the sleepers are cemented directly into the concrete. As a result, longevity of the tracks increases, and maintenance and repair costs are reduced.

#### ***The 3D Leica Geosystems Guidance System—meets the highest demands in precision***

Fully automatic, no guide wire required and with a precision of  $\pm 10$  mm in position and  $\pm 3$  mm in height is the performance standard of the machine guidance systems of Leica Geosystems. Two Leica Geosystems TCA

1800L total stations provide real-time spatial data measurement at a frequency of 6 Hz that enable precise determination of the paver’s position. By permanently comparing the design position with the actual position, the paver is kept reliably and precisely “on track.”

#### ***Enormous advantages: time and money saved—flexibility enhanced***

Logistical bottlenecks on narrow roads, dams and most of all in tunnels make wireless guidance systems a superior choice compared to conventional methods.

“The final results surpassed our expectations. Control measurements showed standard height deviations of  $\pm 3$  mm, which is clearly better than the stipulated tolerances. We are convinced of the precision of Leica’s 3D guidance system,” said Karlheinz Klumpp, the survey coordinating engineer for section B of the “ARGE Feste Fahrbahn” company.