



NEWS

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PLEASE WIPE OFF YOUR SHOES BEFORE ENTERING
SOPHISTICATED EAST L.A. TUNNEL BORING MACHINES KEEP SUBWAY
WORKPLACE *SPIFFY*; LOWERS RISK OF SETTLEMENT, IMPROVES SAFETY

It would be easy to mistake new twin tunnel boring machines to be used on the 3.7-mile extension of the Metro Red Line in East Los Angeles for NASA rocket ships or even amusement park sky tower observation decks.

Measuring 300 feet by 22 feet in diameter and bearing little resemblance to their currently in use cousins to the west, the Slurry Shield or Earth Pressure Balance Shield, a technology only recently introduced in the U.S. but popular for years overseas, can be operated from enclosed, 30-foot-long, air tight forward compartments featuring the latest in computerized gizmos and rows of terminals.

Though each elite machine costs approximately \$5 million to \$7 million more than its MTA Metro Red Line predecessors, the closed face machines in the long run also should prove more cost effective, MTA engineers and consultants believe, since fewer work stoppages due to soil grouting, gas leaks and ground water are expected.

The recommendation to purchase the state-of-the-art machines was made by a MTA Tunnel Advisory Panel headed by Dr. Dan Eisenstein, professor at the University of Alberta, Canada, Department of Civil

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Engineering, with the belief the machines, to be put to the test starting in 1998, better adapt to changing soil conditions. The internationally respected Eisenstein is the past president of the International Tunneling Association and has been a consultant or adviser to over 100 major worldwide projects.

Surface settlement arising from the use of closed face machines is expected to be much less than with the older machines and would not be significant enough to cause serious damage, a major panel consideration since tunneling in East Los Angeles will take place directly under 250 residential and commercial buildings.

"The ground conditions are not that much different than, say Downtown, Hollywood or North Hollywood, but since we'll be digging under many more buildings, we'll be paying special attention to settlement, and that's why these machines were selected," said MTA Construction Project Manager Alfonso Rodriguez, who traveled to Spain and Germany last year to observe the machines in action.

Cleaner working conditions also is a benefit of closed face tunneling machines, something Rodriguez witnessed first hand.

"So refined, in fact, are these machines that wherever they're used it's not unusual to see engineers walking the tunnel in dress shoes because the machines limit water seepage," Rodriguez said.

"Not only is mud in short supply but you won't even see the excavated dirt since it goes directly from the machine's bulkhead into the cars of an underground train," he continued.

Closed face tunnel boring machines work best, concluded the panel, after reviewing 74 subway projects underway in 18 countries - out of which 45 subway projects, or 60 percent, were using the new technology. The results are contained in "Report on Tunneling Feasibility and Performance," a

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