Directional Drilling for Gold Slickline.

PROJECT PROFILE
DRILLING

CLIENT
Gold Slickline

DIRECTIONAL DRILLING

KAMLOOPS, British Columbia

SITUATION:

Gold Slickline had previously been using shaft boring machines to complete raised bores for ventilation shafts. The process had been frustrating due to the deviations encountered with that method, requiring them to mine over to the borehole rather than intersect the tunnel with the borehole. Meetings with Layne and IDS (Layne's Directional Drilling Division) led to Layne being hired.

SOLUTION:

IDS was commissioned to directionally drill a pilot hole to intersect the tunnel and then ream the pilot hole to 14 7/8 inches. The Layne Team then installed and cemented 8 inch casing throughout the borehole into the top of the tunnel, secured with a rock-bolted plate and sealant.

The directional hole set up directly over the underground tunnel and remained vertically straight to 2000 feet; the directional drilling stopped at 1920 feet. The intent was to install and cement casing in the borehole to facilitate material transport into the mine tunnel. The surface collar pipe was set at approximately 60 feet. The plan was to drill a 6 1/4 inch diameter pilot hole conventionally to 500 feet and continue until the inclination threatened to take the path of the hole outside the desired column of a 5 feet radius. At just beyond 500 feet, the hole had reached 1.3° deviation and was at the outer limits of that column.

The directional equipment was then employed, and although the hole did move out of the column, it was quickly brought back into the desired zone and kept there for the remainder of the hole. In two instances the directional drill adjustable bent housing had to be changed to combat the formation influence, but it was generally maintained at a 1.15° bend. This was achieved by using what is known as the performance drilling method, where the drill string is oriented to bend the hole in a desired direction, the entire assembly is slid to adjust the inclination or azimuth and then the assembly is rotated when no adjustment is needed. At the end of the project, the hole managed to break out only 30 inches from dead center of the column. This was true success for both Layne and the client.

SERVICES EMPLOYED:

+ RD20 top head drive rotary drill
+ Fluid drilling system consisting of bentonite and polymers
+ Directional drilling planning and navigation software
+ Electronic magnetic based survey instruments
+ Non-magnetic drill collars
+ 4.750” Directional drilling down-hole motor with 0-3° adjustable bent housing

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