Freeze hole drilling with W100, Hallandsåsen, Sweden – Part I

Project Description:
Construction of two 8.6 kilometer long railway tunnels through the Hallandsåsen ridge in southern Sweden. The tunnels have a diameter of 10.6 meter. A special challenge for the project is a section called the Mölleback zone. This zone consists of several subsections some made up of clay and silt and others of fractured rock, gravel and clay. The fractured rock sections are characterized by high water flows, up to 900 liters/minute, and pressures up to 12 bar. The whole Mölleback zone had to be frozen in order for the TBM to be able to penetrate. Each tunnel required 16 freeze holes with a length of 100 meters evenly spaced on a perimeter with an 8 meter diameter.

Drilling was done in two main steps:
1. Steered drilling with mud motor, OD 171 mm.
2. Installation of glass fiber casing, OD 160 mm, using W100 and W-REX.

Actually, before the steered drilling was done the Wassara W80 hammer was used to drill 3 grout holes, 125 meter long, in each tunnel. This was necessary in order to stabilize the formation. Main contractor was Skanska-Vinci and the drilling contractor was Insond AG.

Result:
The Wassara system proved to be successful in this difficult application and all freeze holes were completed according to specifications.