

DESIGN OF BOREHOLE SEALS IN ROCK: METHODOLOGY AND PROCESS

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Abstract

Design methodology and process for sealing of boreholes in rock mass have been derived. The design process considers site-specific characteristics of all rock units along the borehole length. The design parameters include the borehole conditions, rock characteristics, groundwater, geochemistry, in-situ stresses, potential ground deformation, seismic activities, and performance requirements. The mechanical and hydraulic bonds of the seals represent their functional requirements. The design criteria derived from relevant experimental researches are used to select the sealing materials for each rock unit, and to develop the seal specifications. The design solutions are the results of selecting appropriate sealing materials, which include mixtures of cement, bentonite, crushed rock and granular materials. The seal system performance (seal, host rock and their interface) is evaluated in terms of the mechanical stability, containment integrity and chemical compatibility, while considering the economic constraints and the local resources.

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