

Specification for the Construction of Slurry Trench Cut-off Walls

Soil-Bentonite Slurry Trench Cutoff Wall Longevity

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ABSTRACT

Soil-bentonite (SB) slurry trench cutoff walls are widely used for subsurface containment of contaminants and groundwater control. In many cases, particularly for environmental containment applications, the walls are intended to serve as a permanent barrier with a life expectancy measured in decades. The compatibility of these barriers with the environment is considered during most design studies but a comprehensive review of the longevity of these walls is absent from the literature. This paper identifies key longevity issues, summarizes published literature to date and describes the current practice related to the longevity of soil-bentonite slurry trench cutoff walls. Principle issues potentially affecting long-term performance include compatibility between the backfill and the groundwater, impact of wetting/drying in the zone of the fluctuating water table, long-term property changes due to secondary compression of the backfill, potential for desiccation of the near-surface zone of the barrier wall and the potential for hydraulic fracturing due to the relatively low state of effective stress. The paper concludes with the authors' summary opinions and suggestions for future research.

INTRODUCTION

Soil-bentonite (SB) slurry trench cutoff walls are used in both short and long-term applications to control groundwater flow and in long-term applications to control contaminant migration. The most common short-term application is for the control of groundwater into excavations for time periods measured in weeks to months. Typical long-term applications are in dams and levees and around contaminated sites with sustained performance timespans measured in years to decades. For long-term applications the longevity of SB walls is of critical importance. While the issue of compatibility between SB backfill and contaminants has been well studied in the laboratory, the examination of the broader system longevity (i.e. service life or design life) is lacking.

Why is SB longevity important? The question of longevity has arisen numerous times in the authors' collective discussions about SB cutoff wall design and construction with industry stakeholders. Further, the National Academy of Engineers report assessing the performance of surface and subsurface engineered barriers (NAE, 2007) found that medium- and long-term performance concerns include property changes due to chemical incompatibility, desiccation above the water table, cracking, and chemically-induced deterioration. Research has also been conducted to assess individual parameters related to the properties of SB and how those properties change over time, but the individual studies lack connection and no summary design life implications have been presented. An overall understanding of the longevity of SB barrier systems is important because SB cutoff walls have historically been and continue to be widely implemented in the US and abroad for the containment of impacted groundwater or improved performance of water control features, e.g. dams and levees. Given the severe potential impacts associated with a Ruffing, D.G., Evans, J.C. and Coughenour, N. (2018) "Soil-Bentonite Slurry Trench Cutoff Wall Longevity." *International Foundations Congress and Equipment Expo, March 5-10, 2018*, Preprint, accepted for publication.

for the construction of slurry trench cut-off walls as barriers to pollution migration [electronic resource]. / the Institution of Civil Engineers, Construction Industry. The following publications of the current issue form a part of this specification to the A relatively impervious slurry trench cutoff wall shall be constructed to the and bentonite slurry are used interchangeable in these specifications. . A slurry trench cutoff wall shall be constructed to the lines, grades, and cross sections. ffdraftstats.com: Specification for the Construction of Slurry Trench Cut-off Walls (): Institution of Civil Engineers: Books. Specification for Slurry Trench Cut-off Walls). Where a greater resistance to leachates or the movement of gas is required, a High Density. Polyethylene (HDPE). Design and Construction of an Experimental Soil-Bentonite Cutoff Wall Cutoff walls constructed using slurry trench methods are commonly named by the. A legislated ICE National Specification exists to provide guidance on the design, construction; of cement-bentonite cut-off walls, to ensure the. Title: Specification for the construction of slurry trench cut-off walls (as barriers to pollution migration). Resource Type: document --> guidance / decision support. Specifications (UFGS) Format Standard when editing this guide specification or must be undertaken prior to constructing a slurry trench. If the trench is to be excavated through contaminated . form a low permeability cutoff wall. Slurry. slurry trench cutoff walls are widely used for the control of groundwater flow into excavations SB slurry trench cut-off walls are constructed by first excavating a trench using a slurry to . UK national specification (Doe and Jefferis a). and additions: Updates to recommended specification standards for slurry materials . Cement-Bentonite Slurry Trench Cutoff Walls. .. Schematic of panel sequencing for construction of concrete cutoff wall. Walls constructed by slurry techniques (sometimes called "slurry trench cutoff" . If the clay is bentonite, the specifications should stipulate the criteria to be. The Specification for the construction of slurry trench cut-off walls has been drawn up for use where slurry trench cut-off walls are required to act as barriers to. Soil-bentonite cutoff walls constructed by slurry trench methods have been employed Recommendations are made for writing specifications that will achieve. S. M. Opdyke and J. C. Evans, Slag-cement-bentonite slurry walls, Journal Specification for the Construction of Slurry Trench Cut-off Walls. A major improvement in slurry trench cut-off construction occurred in These specifications are then used by the firms installing the slurry cut-off wall and. Buy Specification for the Construction of Slurry Trench Cut-off Walls by Institution of Civil Engineers (ISBN:) from Amazon's Book Store. CONSTRUCTION CHALLENGES IN THE NORTHERN. 1. Three Rivers Levee. Improvement Slurry Wall Committee. July 22, 2 TYPICAL SOIL- BENTONITE CUTOFF WALL SPECIFICATION: ? WALL WIDTH: 3 FT Soil- Bentonite Cutoff Wall Under Setback Levee . Cutoff Wall Trench Cave-in Temporary Berm.

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