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Tied-Back Sheet Pile Wall Collapse – A Case Study

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Extended Abstract

The investigation results of a sheet pile wall collapse in Canada are presented in this study. The collapse reportedly occurred several weeks after the shoring wall installation and after reaching the planned excavation depth. In order to determine the origin and cause of the wall collapse and to identify the factors triggering the failure, an investigation program was implemented, including documentation of the visible damage, examination of the field inspection records, examination of the subsurface conditions onsite, review of the shoring wall design and as-built conditions, and the chronological order of events leading to the reported collapse.

A review of the subsurface profile and the construction records showed the deep challenging soil deposits and the extensive groundwater control measures that controlled the performance of the wall. Reviewing the wall design calculations showed the lack of wall embedment. The site observations showed what looks like the overstressing of the shoring wall near the dredge line. Thorough review of the site inspection records and photographs showed that a combination of earthwork activities followed by a significant rainfall event combined with a sudden increase in temperature turning from negative to positive temperature triggered the wall collapse.