

**HEALTH AND SAFETY CHALLENGES IN DEEP
TRENCH EXCAVATIONS FOR PIPE LAYING
SITES IN SRI LANKAN CONTEXT**

**MASTER OF SCIENCE
IN
CONSTRUCTION PROJECT MANAGEMENT**

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**HEALTH AND SAFETY CHALLENGES IN DEEP
TRENCH EXCAVATIONS FOR PIPE LAYING
SITES IN SRI LANKAN CONTEXT**

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“This dissertation was submitted to the Department of Civil Engineering of the University of Moratuwa in partial fulfilment of the requirement for the Masters of Science in Construction Project Management”

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DECLARATION

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ABSTRACT

Recent developments in Sri Lanka have accelerated the construction, and deep trench excavation is one of the main construction activities. Health and safety in construction includes safe work sites while addressing cost, quality, productivity, and customer satisfaction. Health and safety reduce project risk, an important parameter in construction project management. This research aims to identify and analyze health and safety challenges in deep trench excavations and to determine mitigating measures.

Data for the study was collected through personal interviews and a questionnaire survey, covering project managers, engineers and safety officers with experiences in trench excavations. The respondents were selected using simple random sampling technique and based on Cochran's formula for an infinite population, the sample size was 96. SPSS software was employed to analyze the data and the conclusion were made considering descriptive statistics.

The results elaborate that the most common hazards associated with deep trench excavations are side wall collapse and earth work support failures, while the most common causative factors for accidents are the absence of adequate shoring systems and the negligence of the workers. The most commonly encountered limitations for implementing health and safety measures in shoring arrangements are financial constraints, followed by time constraints. Hence, it is recommended to include separate billing items for shoring arrangements when creating tender documents and to allocate sufficient funds in the engineer's estimates to mitigate the risks associated with health and safety in deep trench excavations. Furthermore, during the bid evaluation phase, special consideration should be given to determine adequacy of the bidders' allocations for safety and shoring arrangements. Since, cost is the most significant impediment for implementing protective systems, it is recommended further studies on the cost and time constraints of proper shoring arrangements in deep trench excavations, as well as an economic analysis of various shoring types.

Keywords: Construction industry; Trench excavations; Safety challenges; mitigating measures

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ABBREVIATIONS

CIRPC	-	Construction Industry Research and Policy Center
NIOSH	-	National Institute of Occupational Safety and Health
NWSDB	-	National Water Supply and Drainage Board
OSHA	-	Occupational Safety and Health Administration
PPE	-	Personal Protective Equipment
SPSS	-	Statistical Package for Social Sciences
USA	-	United States of America

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