



Document details

< Back to results | 1 of 1

↗ Export ↓ Download 🖨️ Print ✉️ E-mail 📄 Save to PDF ☆ Add to List More... >

[Full Text](#) View at Publisher

International Journal of Advanced Trends in Computer Science and Engineering
Volume 8, Issue 1.6 Special Issue, 2019, Article number 45, Pages 303-309

The stability of diaphragm wall for deep excavation (Article)

Hamzah, M.H.^a ✉️, Taib, A.M.^a ✉️, Sharil, S.^a ✉️, Ramli, A.B.^b ✉️, Hasbollah, D.Z.A.^c ✉️

^aFaculty of Engineering and Built Environment, Universiti Kebangsaan Malaysia, Malaysia

^bKuliyah of Engineering, Universiti Islam Antarabangsa Malaysia, Malaysia

^cSchool of Civil Engineering, Universiti Teknologi Malaysia, Malaysia

Abstract

View references (30)

Rapid urbanisation and the increase in population has led to massive use of underground spaces, especially in the city. Before an underground structure is built, the use of retaining structure is crucial in order to prevent the excavation from failure. Diaphragm wall is a widely used retaining structure, particularly for deep excavation. A holistic understanding of the performance and its behaviour is essential to provide stability of the soil retained. A parametric study by using Plaxis2D has been conducted to determine the factors affecting the stability of diaphragm wall and the excavation sites in underground Mass Rapid Transit station of Hospital Kuala Lumpur (HKLX). The objectives of this study are to determine the effect of diaphragm wall stiffness, groundwater drawdown and the depth of wall for deep excavation. The stability is captured based on the lateral deflection of wall, bending moment, safety factor and ground movement near the diaphragm wall. From the study, it is found that the diaphragm wall with high stiffness can reduce wall deflection up to 20% with the addition of 49% bending moment and achieve a high factor of safety. Furthermore, groundwater drawdown is seen reducing lateral deflection of the wall up to 1.08% as well as increasing the factor of safety. Finally, decreasing wall depth reduces the wall deflection by 0.38% and also the basal heaving. © 2019, World Academy of Research in Science and Engineering. All rights reserved.

SciVal Topic Prominence ⓘ

Topic: Excavation | Foundations | Wall deflections

Prominence percentile: 91.540 ⓘ

Author keywords

Depth of wall | Diaphragm wall stiffness | Finite element analysis | Groundwater drawdown

Funding details

Funding sponsor	Funding number	Acronym
Universiti Kebangsaan Malaysia	GGPM-2018-039	

Funding text

Metrics ⓘ View all metrics >



PlumX Metrics

Usage, Captures, Mentions,
Social Media and Citations
beyond Scopus.

Cited by 0 documents

Inform me when this document
is cited in Scopus:

[Set citation alert >](#)

[Set citation feed >](#)

Related documents

Slope stability of landfill with
waste degradation

Ismail, S. , Taib, A.M. , Rahman,
N.A.

(2019) *International Journal of
Innovative Technology and
Exploring Engineering*

Deformation characteristics of
deep excavations for metro
stations in Shanghai soft soil
deposits

Ding, Y.-C. , Wang, J.-H. , Xu, Z.-
H.

(2008) *Shanghai Jiaotong Daxue
Xuebao/Journal of Shanghai
Jiaotong University*

Influence of construction of
super-large excavation with
frame-top-down method on
environments

Li, J. , Bai, T. , Yang, J.
(2012) *Yanshilixue Yu Gongcheng
Xuebao/Chinese Journal of Rock
Mechanics and Engineering*

View all related documents based
on references

ISSN: 22783091

DOI: 10.30534/ijatcse/2019/4581.62019

Source Type: Journal




Document Type: Article

Original language: English

Publisher: World Academy of Research in Science and Engineering

References (30)

[View in search results format >](#)

All | [Export](#) |  [Print](#) |  [E-mail](#) |  [Save to PDF](#) | [Create bibliography](#)

- 1 Goh, A.T.C., Zhang, F., Zhang, W., Zhang, Y., Liu, H.
A simple estimation model for 3D braced excavation wall deflection

(2017) *Computers and Geotechnics*, 83, pp. 106-113. Cited 34 times.
<http://www.elsevier.com/locate/jinca/publications/store/4/0/5/8/9/3/index.htm>
doi: 10.1016/j.compgeo.2016.10.022

[View at Publisher](#)

- 2 Terzaghi, K.
(1943) *Theoretical Soil Mechanics*. Cited 5012 times.
New York: Wiley

- 3 Peck, D.L., Hamilton, M.S., Shaw, H.R.
Numerical analysis of lava lake cooling models; Part II, Application to Alae lava lake, Hawaii
(1977) *American Journal of Science*, 277 (4), pp. 415-437. Cited 66 times.

- 4 Ergun, M.U.
Deep excavations
(2008) *Electronic Journal of Geotechnical Engineering, Electronic Journal of Geotechnical Engineering*, pp. 1-34. Cited 12 times.

- 5 Ou, C.-Y., Liao, J.-T., Lin, H.-D.
Performance of diaphragm wall constructed using top-down method
(1998) *Journal of Geotechnical and Geoenvironmental Engineering*, 124 (9), pp. 798-808. Cited 203 times.
doi: 10.1061/(ASCE)1090-0241(1998)124:9(798)

[View at Publisher](#)

- 6 Kaiser, P.K., Hewitt, K.J.
The effect of groundwater flow on the stability and design of retained excavations.

(1982) *Canadian Geotechnical Journal*, 19 (2), pp. 139-153. Cited 12 times.
doi: 10.1139/t82-016

[View at Publisher](#)