京都大学教育研究振興財団助成事業
成　果　報　告　書

平成30年2月28日

公益財団法人京都大学教育研究振興財団
会長　辻　井　昭　雄　様

所属部局・研究科　工学研究科都市社会工学

職 名・学 年　博士課程2年

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助成の種類	**平成29年度　・　国際研究集会発表助成・Ⅱ期**	
研究集会名	国際トンネル会議2017 World Tunneling Congress 2017	
発表形式	☐ 招待　・　☐ 口頭　・　✓ ポスター　・　☐ その他（　　）	
発表題目	The influence of constitutive models on the mechanical behavior of conventional shallow overburden tunnel	
開催場所	ノルウェー、ベルゲン	
渡航期間	平成 29 年 06 月 10 日　～　平成 29 年 06 月 15 日	
成果の概要	**タイトルは「成果の概要／報告者名」として、A4版2000字程度・和文で作成し、添付して下さい。「成果の概要」以外に添付する資料　☐ 無　☐ 有（　　）**	
会計報告	交付を受けた助成金額	300,000 円
	使用した助成金額	300,000 円
	返納すべき助成金額	0 円
	助成金の使途内訳	渡航費 200,000 円
		滞在費 100,000 円
当財団の助成について	（今回の助成に対する感想、今後の助成に望むこと等お書き下さい。助成事業の参考にさせていただきます。） I would like to thanks the Kyoto Univeristy Foundation for their kind support to make this event fasibel for me. Indeed it was a great learning curve and expereince for me. Once again I am extremely thankful for theri financial support from the Kyoto Univeristy Foundation.	

Subject: World Tunneling Congress Event 2017

Background

ITA (International Tunneling and Underground Space Association) and AITES (Association Association Internationale Des Tunnels et de l´Éspace Souterrain) arrange tunneling congress event on annual basis. In 2017, AIT and AITES in collaboration with NFF (Norwegian Tunneling Society) arranged the World Tunneling Congress (WTC) event in Bergen Norway from 9th June to 15th June. Bergen is a city on Norway's southwestern coast. It's surrounded by mountains and fjords, including Sognefjord, the country's longest and deepest.

WTC 2017 program

WTC 2017 event comprised of Sir. Muir Wood and keynote lectures, open session and various technical sessions. The theme for the WTC 2017 event was "Surface challenges-underground solutions", a total of 760 abstracts were received for the congress, out of which 486 were accepted. This against resulted in 340 submitted papers, out of which 337 were accepted. The accepted papers were presented as oral and poster contributions during the WTC in Bergen. The papers were categorized in following 18 categories.

1. Site investigation, ground characterization
2. Urban tunneling (planning, design and construction)
3. Strategic use of underground space for resilient city growth
4. Utilization of underground for hydropower projects
5. Mechanized excavation
6. Innovation in drill and blast excavation
7. Large caverns (planning, design and construction)
8. Underwater tunnels
9. Tunneling for mining purposes
10. Underground waste storage and disposal
11. Innovation in rock support and water proofing technology
12. Operation, surveillance and maintenance
13. Safety management of complex underground excavations
14. Stability assessment, risk analysis and risk management
15. Seismic design of tunnels and underground excavations
16. Tunnel refurbishment
17. Case histories-lesson learnt
18. Topic not specified

All paper in the proceedings have been reviewed by 2 independent reviewers. The 42 members of the Scientific Committee and the 50 members of the additional team of expert reviewers were utilized. We submitted the paper under the category no. 03 (Urban Tunneling) and it was selected for the poster presentation.

Keynote lectures

In every WTC event there is always a Sir. Muir Wood and Keynote lecture. The speakers who have achieved excellence in their respective fields are invited. This year Sir. Muir Wood lecture was given by Emeritus Prof. Hakon Stille on topic "Geological uncertainties in tunneling – Risk Assessment and Quality Assurance. The key note lecture was delivered by Nuh Bilgin on the topic "The factors effecting the performance on three different TBMs in a complex geology in Istanbul". The second key note lecture was delivered by the well renowned Emeritus Prof. Nick Barton on the topic "Rock as a construction material for tunnels". Apart from this an opens session was conducted on the theme of the WTC 2017 event i.e. "Surface challenges-underground solutions". Four distinctive guests from various countries were invited to share their thoughts and experience during the complex projects planning and execution. After their brief introduction the session was followed by the interactive session between the audience and the invited guests.

Figure 1. Opening ceremony

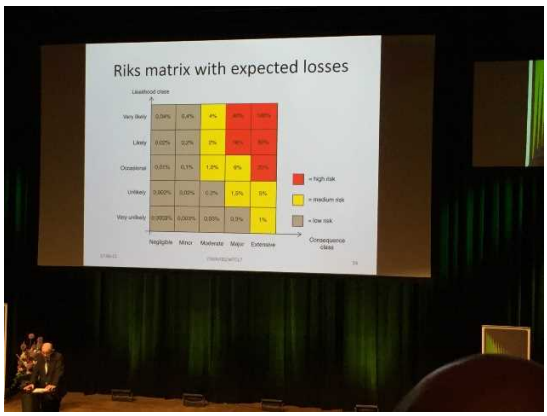

Figure 2. Prof. Hakon Stille delivering the Sir. Muir Wood lecture

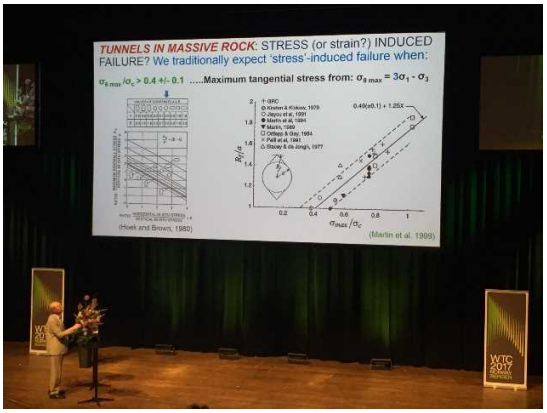

Figure 1. Prof. Nick Barton delivering the Keynote lecture

Poster presentation

Our paper with title “The influence of constitutive models on the mechanical behavior of conventional shallow overburden tunnel” was amongst the selected papers in the category of Urban Tunneling for the WTC proceedings. The assigned mode of presentation was poster. In this study, a circular tunnel section of 10m diameter with different overburden conditions i.e. 0.5D. 1.0D and 1.5D has been analyzed in loose sandy ground, where D is the diameter of the tunnel. As most of the studies to date are focused on surface settlement due to the tunneling. But it is important to deeply understand the stress path during the tunneling excavation. The soil was modeled by two famous and widely used constitutive models i.e. Mohr Coulomb and Modified Cam Clay. The results were presented in terms of ground reaction curve and stress path during the progressive relaxation of the ground at the selected points along the tunnel crown and spring line. In the end, the effect of support installation on stress path was evaluated.

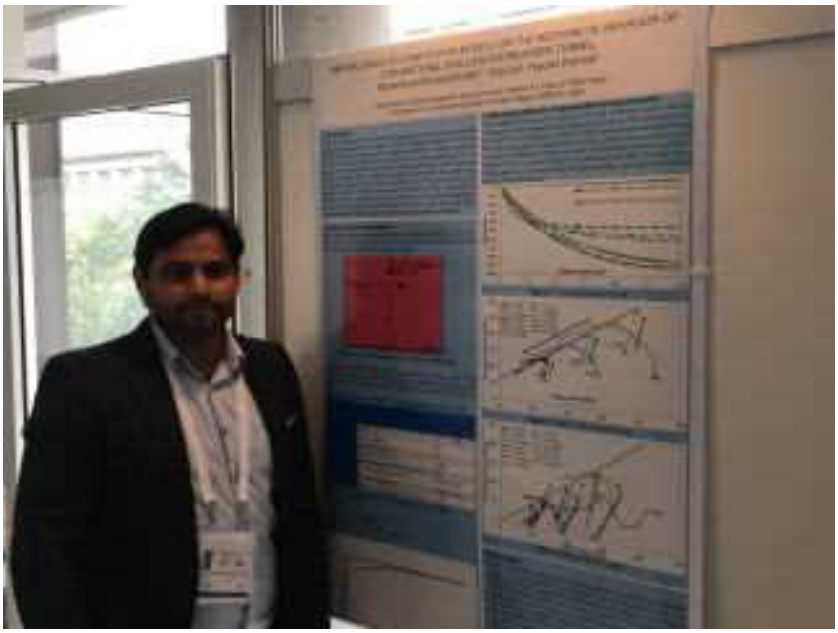

Figure 2. First author during the poster presentation at WTC 2017