出國報告（出國類別：其他-出席國際會議）

出席 ICCEMS 2017 國際研討會
公務出國報告

服務機關：國立嘉義大學土木與水資源工程學系
姓名職稱：陳建元 教授
派赴國家：韓國首爾
出國期間：2017.05.25-2017.05.29
報告日期：2017.06.06

摘要

本次出席發表學術口頭報告題目為「Modeling of Batter Pile Behavior under Lateral Soil Movement」。Pile foundation is frequently used when structures are located on weak sublayers or are at risk from lateral loadings such as earthquakes. The design of pile foundations has recently become crucial to stop slope movement. To understand the behavior of pile foundations subjected to lateral soil movement, the three-dimensional Fast Lagrangian Analysis of Continua (FLAC3D) program was used to perform numerical simulations, which can reduce the cost of field testing. Vertical piles and batter piles were combined into 3 × 3 pile groups, and the response of batter piles to soil movement was analyzed. The outer batter piles led to an increased bending moment in the middle, vertical pile row. Increasing the pile spacing and the presence of battered piles reduced the pile group's displacement. The batter pile group's maximum bending moment was smaller than the vertical pile group's in sand soil, but 5–8 times higher in clay soil.

關鍵字：batter pile, numerical analysis, soil movement.

目錄

一、參加國際會議之目的

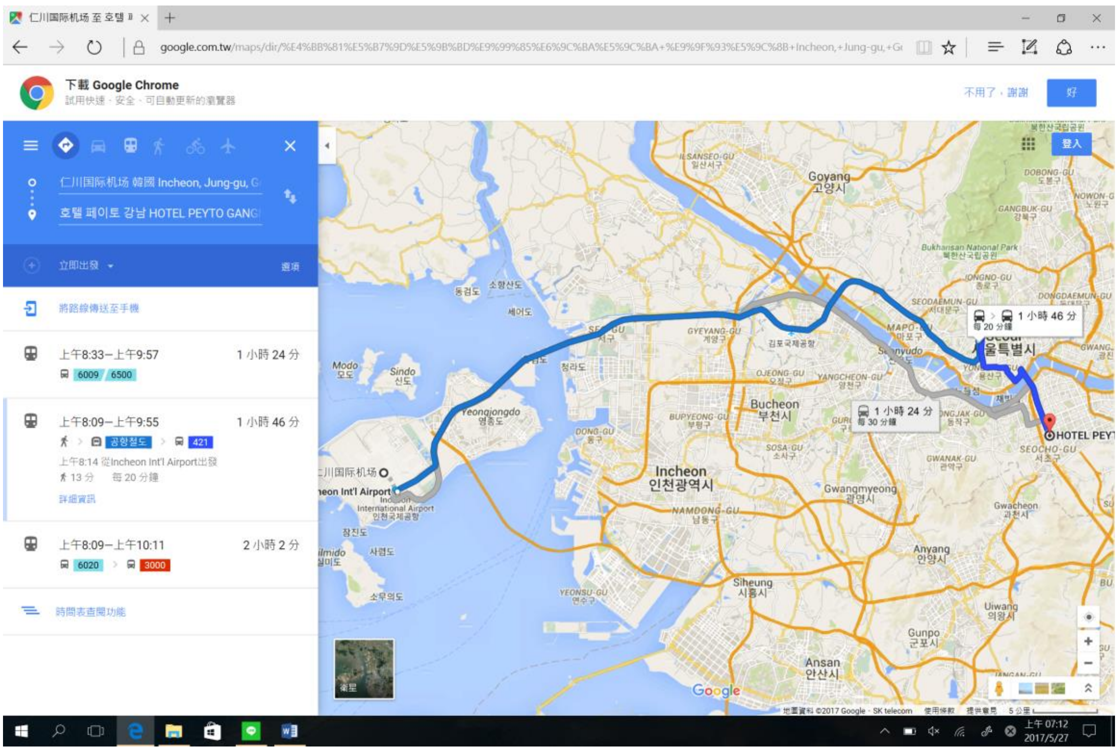
參加本次國際研討會 ICCEMS 2017 (2017 the Second International Conference on Civil Engineering and Materials Science)之目的除受邀擔任為研討會的 plenary speaker 及會議場次之主持人外，並為研究論文的口頭發表。本次出席發表學術口頭報告題目為「Modeling of Batter Pile Behavior under Lateral Soil Movement」。有鑑於斜樁的使用逐漸受工程界所接收，本研究評估以斜樁受土壤移動或用來抵抗邊坡土壤滑動的樁身反應分析。以進一步了解斜樁之反應，作為工程設計之參考。

藉由此次國際學術研討會議的參與不但有助於了解國際間的研究現況，也從口頭發表場次中，增進自己視野與未來研究發展能力，有助於日後進行相關研究之本質學能提升與精進研究技巧及實際國際研討會務的參與。

二、參加國際會議之過程

會議時間與地點

本會議於 2017 年 5 月 26-28 日於韓國首爾江南區的 Peyto hotel 舉行(圖一)。研討會場從仁川國際機場搭乘市區地鐵(捷運系統)約需 2 個小時才能到研討會場之旅館。圖一為研討會地點位置圖與捷運搭乘路線。圖二為研討會會場外觀，圖三為研討會報到櫃台。



圖一、研討會場 Peyto hotel 位置圖(摘自 Google 網頁)

圖二、研討會會場 Peyto hotel 外觀

圖三、研討會報到櫃台

會議議程

本次會議議程如下(表一)，表二為研討會本人發表場次議程表:

表一、研討會議程表(摘自研討會網頁)

AGENDA OVERVIEW

Friday, May 26, 2017		
10:00-17:00	**Registration and Conference Materials Collection**	**Lobby**
Saturday, May 27, 2017		
9:30-9:35	**Opening Remark** **Assoc. Prof. Kyoung Sun Moon** Yale University School of Architecture, USA	
9:35-10:10	**Speaker I**  **Prof. Chien-Yuan Chen** National Chiayi University, Taiwan	
10:10-10:30	**Group Photo & Coffee Break**	**PEYTO HALL (2F)**
10:30-11:10	**Speaker II**  **Assoc. Prof. Kyoung Sun Moon** Yale University School of Architecture, USA	
11:10-11:45	**Speaker III**  **Assoc. Prof. Andrew J. Boyd** McGill University, Canada	

表一、研討會議程表(續)

11:45-12:05	Speaker IV  Asst. Prof. B. Kondraivendhan S.V. National Institute of Technology, India	PEYTO HALL (2F)
12:05-14:00	Lunch	Café PO:Z (3F)
Parallel Sessions		
14:00-15:45	Session 1: Mechanics Analysis and Test of Concrete --7 Presentations	PEYTO HALL (2F)
14:00-15:45	Session 2: Smart Materials Design and Application of Environmental Materials--7 Presentations	Meeting Room 1 (2F)
14:00-15:45	Session 3: Material Handling and Performance Analysis--7 Presentations	Meeting Room 2 (2F)
15:45-16:00	Coffee Break	Foyer
16:00-17:45	Session 4: Geotechnical Engineering and Structural Mechanics--7 Presentations	PEYTO HALL (2F)
16:00-17:15	Session 5: Civil & Structural Engineering--5 Presentations	Meeting Room 1 (2F)
16:00-17:30	Session 6: New Technology of Concrete and Building Material Behavior Research--6 Presentations	Meeting Room 2 (2F)
9:00-18:00	Poster Session	PEYTO HALL (2F)
18:00-20:00	Dinner	Café PO:Z (3F)

Sunday, May 28, 2017	
9:00-17:00	One Day Tour in Seoul

表二、研討會部分議程表(本人發表場次)

<table>
<tr><td colspan="2">Session 4: Geotechnical Engineering and Structural Mechanics –(7 Presentations)
Time: 16:00-17:45
Location: PEYTO HALL (2nd Floor)
Chair: Prof. Chien-Yuan Chen, National Chiayi University, Taiwan</td></tr>
<tr><td>EM026
16:00-16:15</td><td>Anchorage Behaviors of Frictional Tieback Anchors in Silty Sand
Shih-Tsung Hsu, Wen-Ta Hsiao, Ke-Ting Chen, Wen-Chi Huand Ssu-Yi Wu
Department of Construction Engineering, Chaoyang University of Technology, Taiwan ROC

Abstract—Soil anchors are extensively used in geotechnical applications, most commonly serve as tieback walls in deep excavations. To investigate the anchorage mechanisms of this tieback anchor, a constitutive model that considers both strain hardening and softening and volume dilatancy entitled SHASOVOD model, and FLAC3D software are used to perform 3-D numerical analyses. The results from field anchor tests are compared with those calculated by numerical analyses to enhance the applicability of the numerical method. After the calibration, this research carried out the parameter studies by numerical analyses. The numerical results reveal that whether the yield of soil around an anchor develops to ground surface and/or touches the diaphragm wall depending on the overburden depth H and the embedded depth Z of an anchor, this study suggests the minimum overburden and embedded depths to avoid the yield of soils develop to ground surface and/or touch the diaphragm wall. When the embedded depth, overburden depth or fixed length of an anchor increases, the anchorage capacity also increases. Increasing fixed length should be the optimum method to increase the anchorage capacity for fixed length less than 20m. However, when the fixed length of an anchor exceeds 30 m, the increasing rate of anchorage capacity per fixed length decreases, and progressive yield occurs obviously between the fixed length and surrounding soil.</td></tr>
<tr><td>EM023
16:15-16:30</td><td>Analysis of Lateral Buckling of Bar with Axial Force Accumulation in Truss
Arthit Petchsasithon, Nuttapon W., and Suwat D.
King Mongkut's Institute of Technology Ladkrabang, Thailand

Abstract—This research studies the lateral buckling behavior in truss and lateral buckling coefficient of truss. Lateral buckling analysis of truss is performed by simulating the structural model with both end supports being pinned and roller-supports. The analysis is indirectly conducted using Elastic Theory to evaluate the length of lateral buckling by calculating the determinant of the Matrix [K]. Results from the analysis are marginally different from those obtained from finite element program and are considerably less than those obtained from Eurocode standard. This can be concluded that using elastic theory to evaluate lateral buckling coefficient of truss member will result in more economical section.</td></tr>
</table>

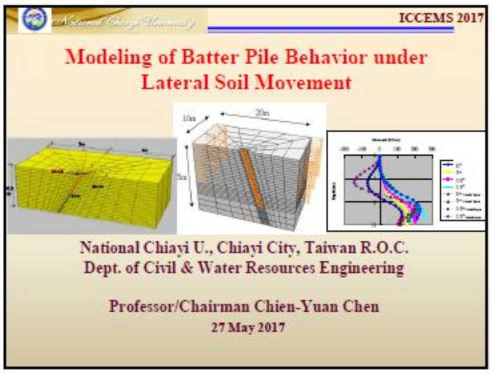
與會過程

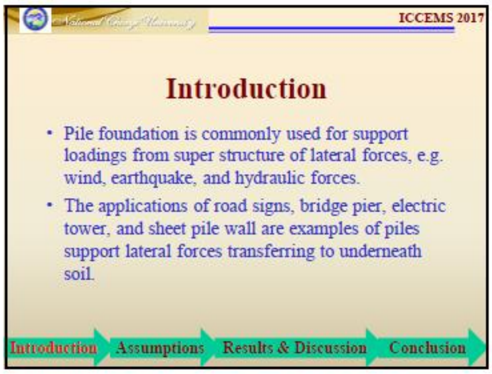
本研討會會議期間共有三天，主要論文發表日期為 5 月 27 日。除專題演講外，論文發表共分成 6 個場次(sessions)。本人發表的文章則被安排在 5 月 27 日上午 9:30 的一個場次的專題演講，並主持下午場次的會議。圖四及圖五為研討會口頭發表情形。

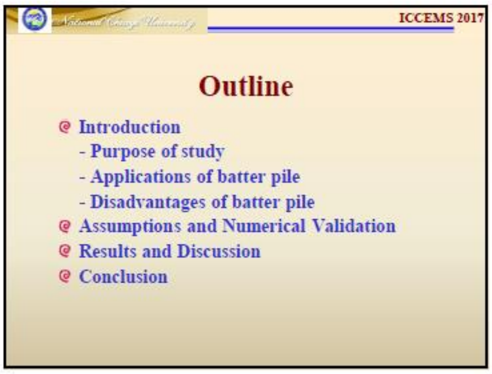
圖四、研討會主要發表會場(一)

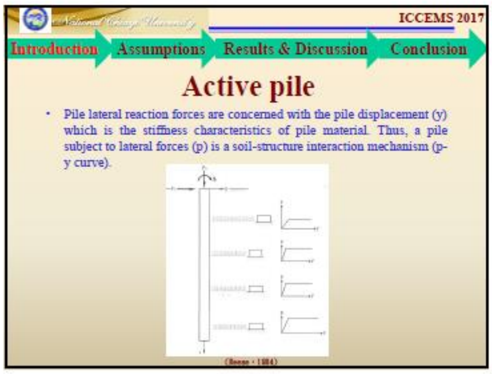
圖五、研討會主要發表會場(二)

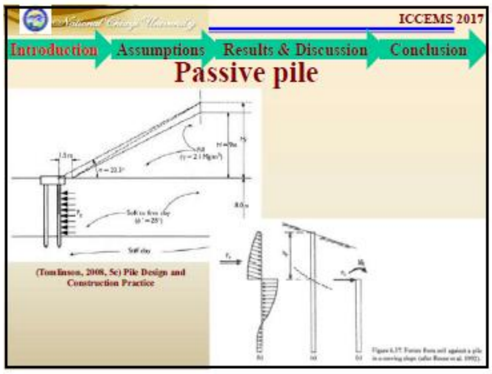
由於此次研討會由大陸及韓國單位主辦，與會者主要為大陸、東南亞及印度學者，少數韓國學者及台灣學者參加。本人已有甚多次口頭發表經驗，但還是第一次擔任國際研討會的 plenary speaker，在發表上尚稱順利。口頭發表簡報檔資料如下(圖六)。



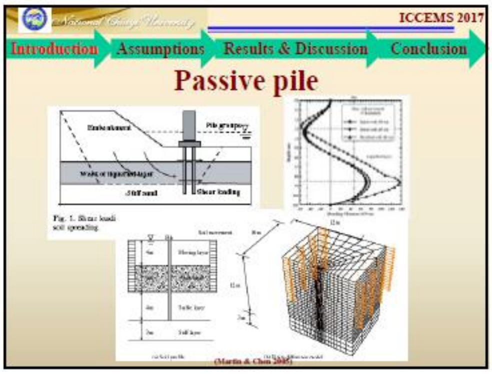


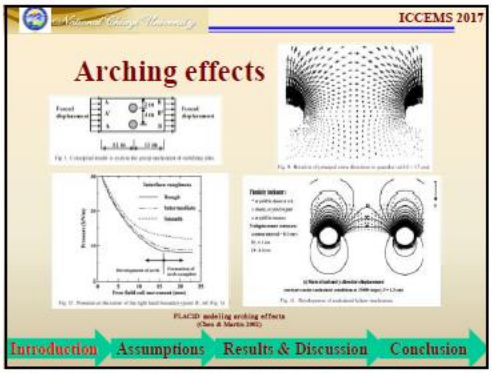


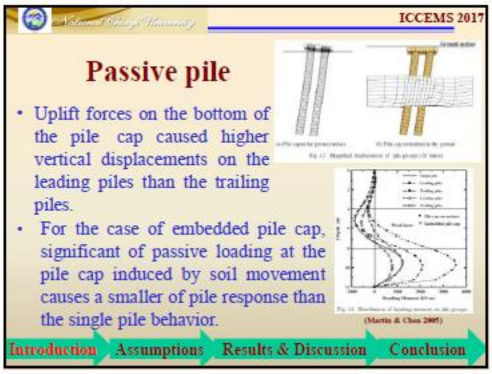


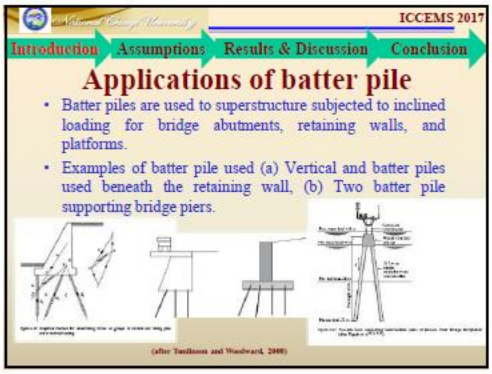


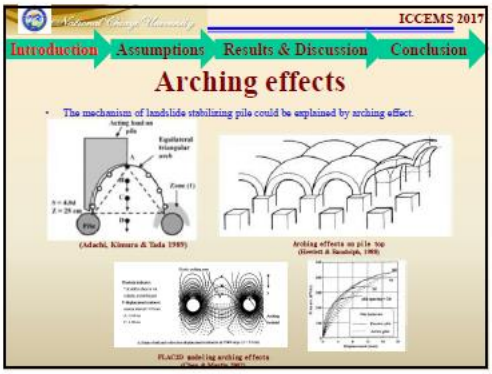
圖六、作者口頭報告簡報檔

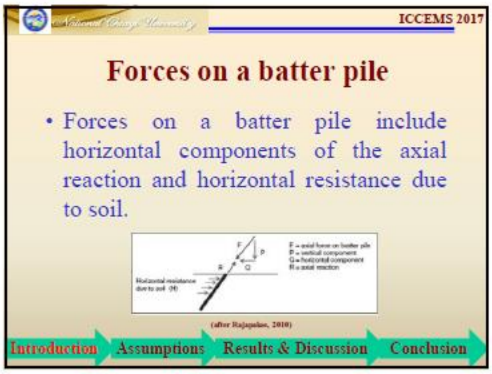




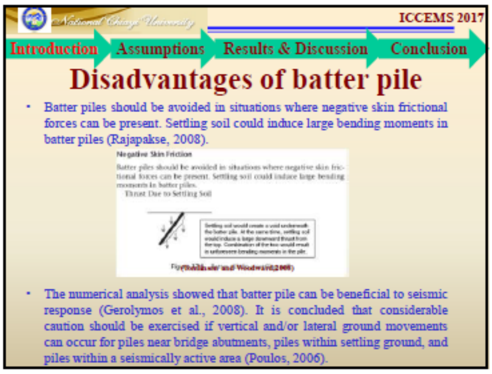


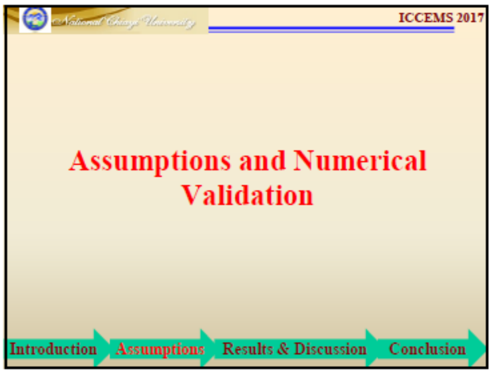


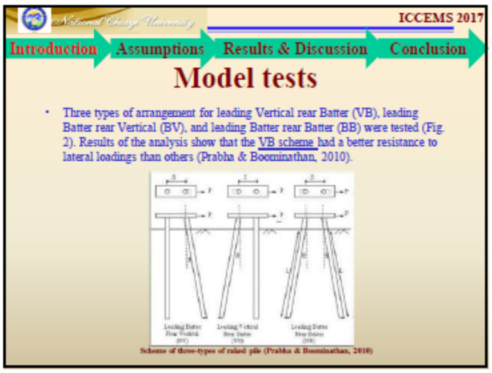


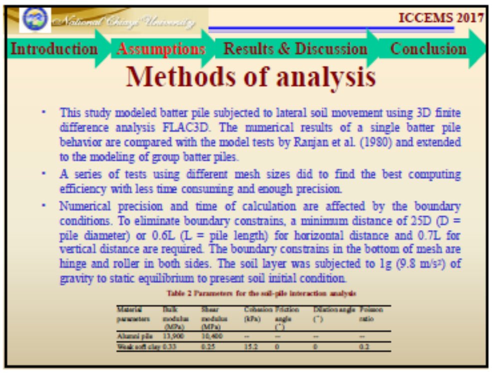


圖六、作者口頭報告簡報檔(續)

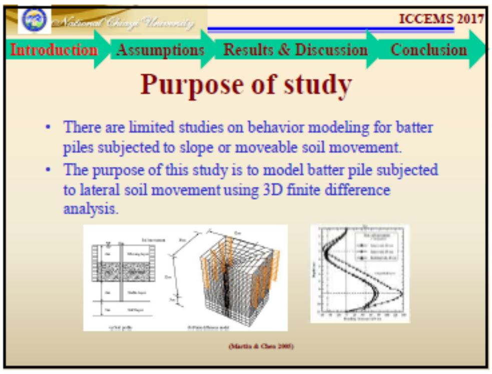


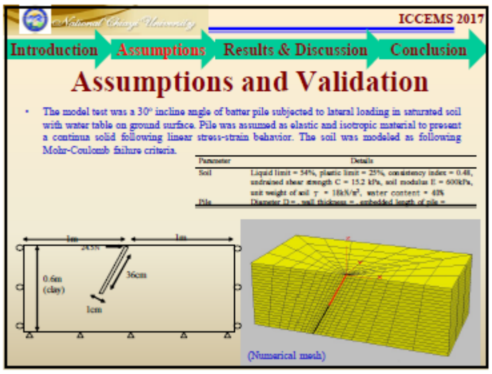






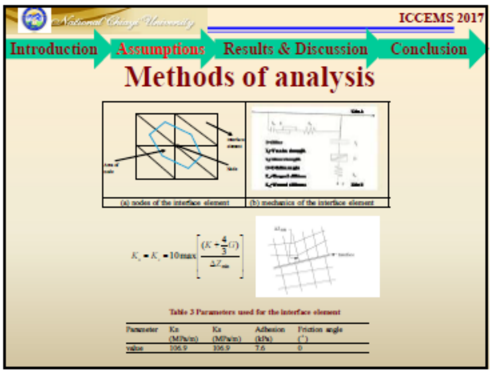
Material parameters	Bulk modulus (MPa)	Shear modulus (MPa)	Cohesion (kPa)	Friction angle (°)	Dilation angle (°)	Poisson ratio
Alumni pile	13,900	10,400	--	--	--	--
Weak soft clay	0.33	0.25	15.2	0	0	0.2

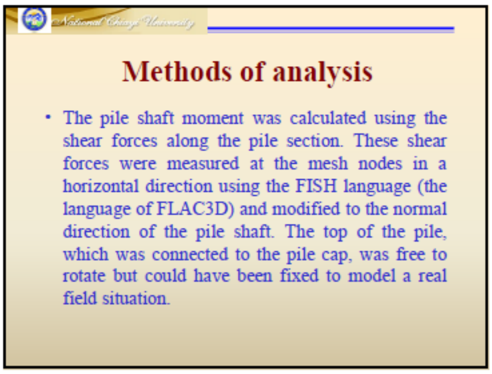


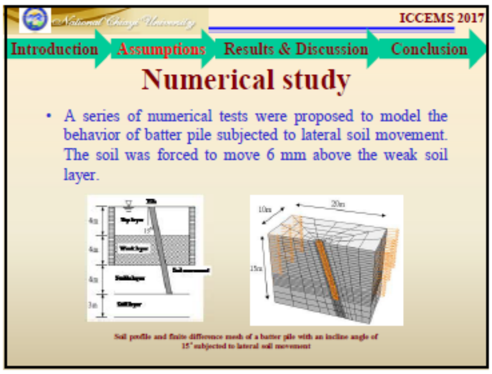


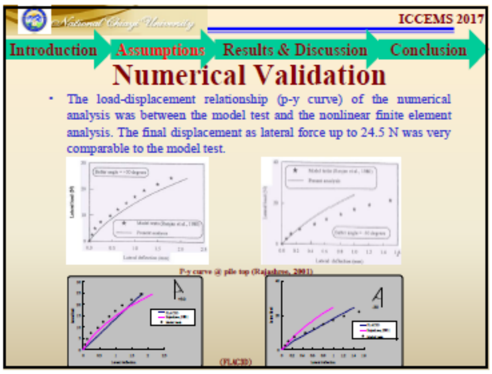
Parameter	Details
Soil	Liquid limit = 54%, plastic limit = 25%, consistency index = 0.48, undrained shear strength C = 15.2 kPa, soil modulus E = 600kPa, unit weight of soil γ = 18kN/m³, water content = 40%
Pile	Diameter D = , wall thickness = , embedded length of pile =

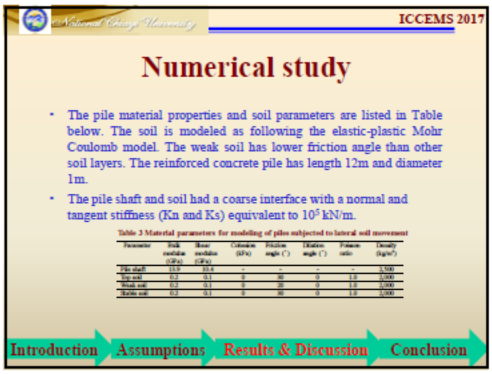
圖六、作者口頭報告簡報檔(續)



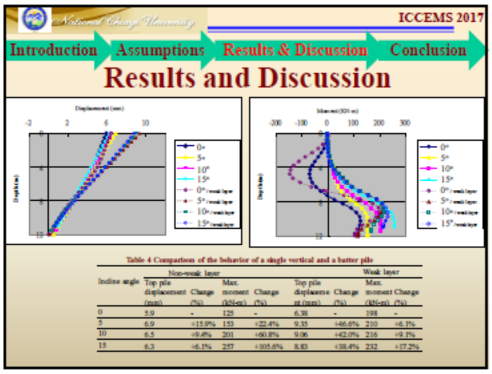


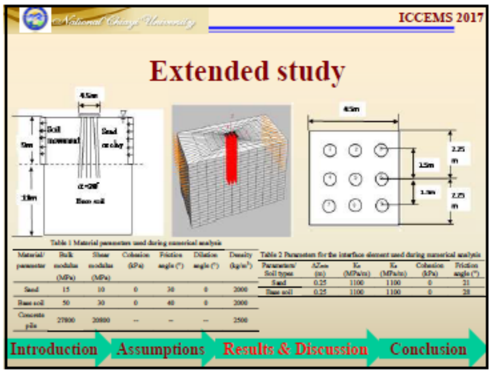


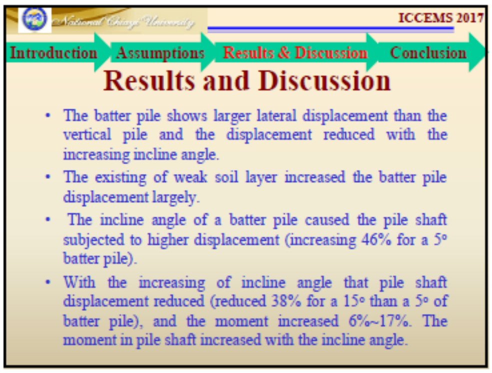


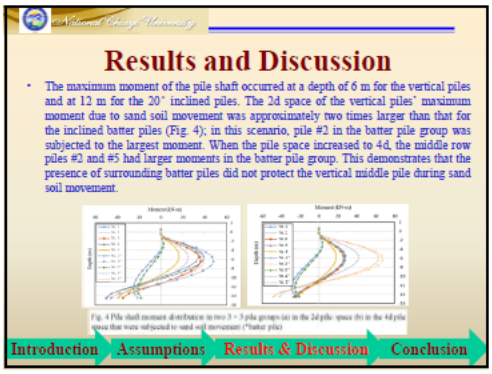


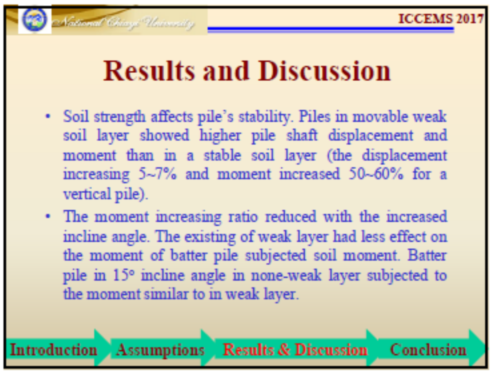
圖六、作者口頭報告簡報檔(續)

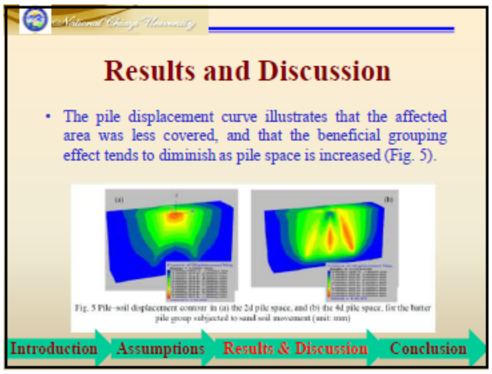




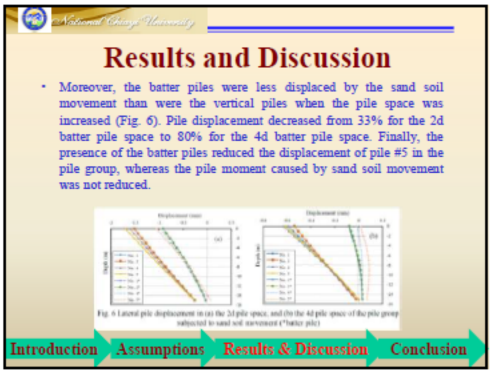


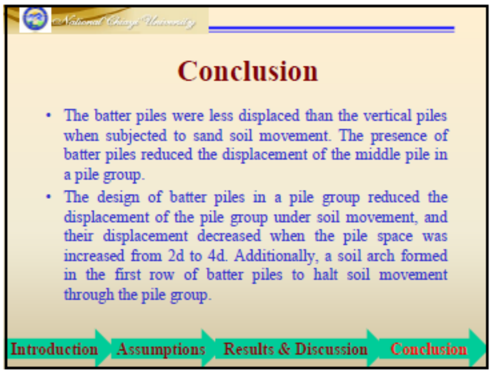


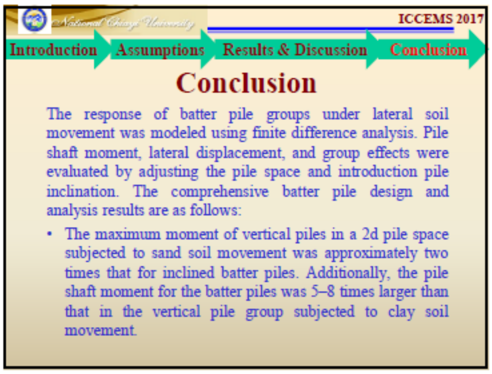




圖六、作者口頭報告簡報檔(續)







圖六、作者口頭報告簡報檔(續)

本次研討會攜回資料包括:

1. 期刊論文電子檔隨身碟，
2. 研討會會議手冊，
3. 研討會致贈紀念品。

考察參觀活動

研討會舉辦首爾市區現地參觀，參觀行程包括歷史宮殿景福宮、北村韓

屋村及首爾塔等名勝古蹟。

圖七、研討會現地參觀-景福宮

本人投宿於東大門附近，因此亦順道前往東大門參觀，並於往來會議期間順便參訪市區及市內溪流-清溪的親水工程。

圖八、首爾市內清溪川

三、心得及建議

韓國在國際旅遊市場的競爭力排名上領先台灣。儘管隨著經濟波動，韓國物價雖高於在台灣的消費，但仍吸引無數國際觀光客前來。在研討會停留期間，本人觀察首爾有下列幾點特點:

1. 首爾市充滿歷史古蹟與宮殿，讓韓國人講文化、重根基，相形之下台灣上政府、下社會卻讓人覺得不講固有文化與沒有歷史根基。
2. 市區國際高級飯店鄰立，購物街道整齊清潔，舉凡市內小的清溪川溪水甚清澈至大的漢江流域，居然無任何垃圾漂流其上或堆積於岸邊，讓人驚艷。
3. 韓人愛用國貨支持國企，舉凡三星手機、現代汽車等到處可見，團結的力量讓人不可輕忽。

<table>
<tr><td colspan="2" rowspan="5">訪談對象之聯絡資料</td><td colspan="4">姓名：　　　　服務單位：
職稱：</td></tr>
<tr><td colspan="4">電話:　　　　傳真:-</td></tr>
<tr><td colspan="4">e-mail:</td></tr>
<tr><td colspan="4">地址：-</td></tr>
<tr><td colspan="4">建議事項：無</td></tr>
<tr><td>申請人
簽章</td><td></td><td>系所主管
簽章</td><td></td><td>院長
簽章</td><td></td></tr>
</table>