



The First Vietnam Symposium  
on Advances in Offshore Engineering

# ENERGY & GEOTECHNICS

UNDER THE AUSPICES OF THE ISSMGE TECHNICAL COMMITTEES TC-308 AND TC-209

NOVEMBER 1-3  
**2018**  
HANOI, VIETNAM



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## Introduction

The Association of Vietnamese Scientists and Experts (AVSE Global) plans to organise the Vietnam Symposium on Advances in Offshore Engineering (VSOE) every two years in collaboration with universities, research institutions and industrial partners worldwide and in Vietnam.

The first symposium, VSOE2018, will be held in Hanoi, Vietnam from 1-3 November 2018 and co-organised by the National University of Civil Engineering under the auspices of two specialist Technical Committees TC-308 and TC-209 of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE). The symposium focuses on “Energy and Geotechnics” in recognition of the important role that geotechnical engineering holds within the offshore renewable energy and oil and gas industries. The symposium also covers wider topics that relate specifically to the development of offshore renewable energy industry as well as the transition away from the offshore oil and gas industry.

One of the objectives of VSOE2018 is to create a platform where policymakers, practitioners, and entrepreneurs could promote policy changes that support the development of renewable energy in Vietnam, as well as to generate business opportunities within the energy sector.

In response to our invitation, we have received a tremendous amount of support from a diverse group of participants all over the world. More than 160 abstracts were submitted in the first phase and 120 full papers were submitted in the second phase. Despite our tough review process in which each paper was reviewed by at least two relevant experts, over 85 papers have been accepted and published online by the international publisher Springer as a volume in the [Lecture Notes in Civil Engineering](#) series, indexed by SCOPUS.

We would like to acknowledge the wonderful support of the scientific committee and the invited experts, who have all spent their valuable time and made tremendous efforts to review the papers. We are grateful to the valuable support from our sponsors: [Norwegian Geotechnical Institute](#) (NGI), Norway; [FECON Corporation](#), Vietnam; [Korea Institute of Civil Engineering and Building Technology](#) (KICT), Republic of Korea; [Cathie Associates](#) (International); [Benthic](#); [Lam Pham Construction Company Limited](#) (LPC); and [Sarathy Geotech \(SGES\)](#).

We believe that the symposium will provide readers with the recently collected and valuable knowledge from experts on topics that include offshore engineering and technology innovations, cost-effective and safer foundation and structural solutions, environment protection, hazards, vulnerability, and risk management.

**Dr Hong DOAN**

*On behalf of the VSOE Organising and Scientific Committees*

*Website: <https://vsoe2018.sciencesconf.org/>*

*E-mail: [vsoe2018@sciencesconf.org](mailto:vsoe2018@sciencesconf.org)*

*November 2018*

## Day 1 (01 November 2018)

TIME	CODE	EVENT
08:00 onwards		REGISTRATION <span style="float: right;"><b>Venue: G3 Building</b></span>
08:30 - 09:00		<b>Welcome Ceremony</b> NUCE Representative Dr. Doan Hong (AVSE Global, SUBSEA7, FRANCE) <span style="float: right;"><b>Venue: G3 Building</b></span>
<b>9:00 – 11:45</b>	<b>KL</b>	<b>Keynote Lectures</b> <span style="float: right;"><b>Venue: G3 Building</b></span> <i>Chairs: Mark Randolph &amp; Duc Long Phung</i>
<b>09:00 - 09:45</b>	<b>KL1</b>	<b>Keynote 1: Marine site characterisation – Nick Ramsey, Fugro, AUSTRALIA</b>
<b>09:45 - 10:15</b>		<b>Coffee break</b>
<b>10:15 - 11:00</b>	<b>KL2</b>	<b>Keynote 2: Recent advances in offshore foundation design - Lars Andresen, Norwegian Geotechnical Institute, NORWAY</b>
<b>11:00 - 11:45</b>	<b>KL3</b>	<b>Keynote 3: Bluewater Offshore Wind Energy for Vietnam – Challenges and Opportunities - Ian Hatton, Enterprize Energy Group, UNITED KINGDOM</b>
<b>11:45 - 13:30</b>	<b>Break</b>	<b>Lunch</b>
<b>13:30 - 15:30</b>	<b>TS1-SC</b>	<b>Site Characterisation and Ground Modelling</b> <span style="float: right;"><b>Venue: G3 Building</b></span> <i>Chairs: Robert Whittle &amp; Tien Dung Nguyen</i>
<b>13:30 - 13:50</b>	<b>SCi</b>	<b>Invited Lecture 1: Pressuremeters in the marine environment - Robert Whittle, Cambridge Insitu Ltd</b>
13:50 - 14:00	SC01	› Distribution of Escherichia coli in dredged marine soils collected from waters around Peninsular Malaysia: A relation with geotechnical properties - <i>Chee-Ming Chan (1), Nurashiah Mira Anuar, Mohammad Zawawi Rosman; (1) Universiti Tun Hussein Onn Malaysia, MALAYSIA</i>
14:00 - 14:10	SC02	› Offshore geotechnical properties, a VR/Neural-interpretation: Part 1 - <i>Silvia García (1), Paulina Trejo, Alberto García, César Dumas, Celestino Valle-Molina; (1) Instituto de Ingenieria UNAM MEXICO</i>
14:10 - 14:20	SC03	› Offshore geotechnical properties, a VR/Neural-interpretation: Part 2 - <i>Silvia García (1), Paulina Trejo, Alberto García, César Dumas, Celestino Valle-Molina; (1) Instituto de Ingenieria UNAM MEXICO</i>
14:20 - 14:30	SC04	› A New Calibration Technique to Improve Data Reduction for Stokoe Resonant Column Test - <i>Tan Man Bui (1), C.R.I. Clayton, Jeffrey Priest; (1) GTC Soil Analysis Services (UAE) UNITED KINGDOM</i>
14:30 - 14:40	SC05	› Liquefaction Resistance and Post-Cyclic Settlement of Nam O Sand Subjected to Uni-Directional and Multi-Directional Cyclic Shears - <i>Thanh Nhan Tran (1); (1) Hue University of Sciences - Hue University, VIETNAM</i>
14:40 - 14:50	SC06	› Geotechnical behaviour and Construction problems of Marine Sabkha soil - <i>Suneel Matchala (1), Joong Sub Park, Byoung Youn Kim, Tai Gon Choi, Yong Cheol Jun; (1) Assistant Chief Engineer, Hyundai Engineering Co., LTD, REPUBLIC OF KOREA</i>
14:50 - 15:00	SC07	› Dual-Porosity Model For History Matching and Production Forecast For An Oil Reservoir at Cuu Long Basin, Offshore Vietnam - <i>Nguyen Viet Khoi Nguyen (1, 2), Xuan Huy Nguyen, Quang Khanh Do; (1) Faculty of Geology and Petroleum Engineering, Bach Khoa University, Vietnam National University - HoChiMinh City, (2) PetroVietnam University, PetroVietnam, VIETNAM</i>

TIME	CODE	EVENT
15:00 - 15:10	SC08	› Image-based modelling of shelly carbonate sand for foundation design of offshore structures - <i>Joana Fonseca (1), Sadegh Nadimi, Deqiong Kong; (1) City University London, UNITED KINGDOM</i>
15:10 - 15:20	SC09	› An Experimental Evaluation of Characteristics of Ball Penetration Test in Soft Clay - <i>Tien Dung Nguyen (1), Nghiem Xuan Tran, Le Chi Hung; (1) Infrastructure Engineering Program, Vietnam Japan University, VIETNAM</i>
15:20 - 15:30	SC10	› The role of geo-environmental factors in landscape and visual assessment for shallow-water offshore structures - <i>Slobodan B. Mickovski (1), Gisele Alves Glasgow; (1) Caledonian University, UNITED KINGDOM</i>
<b>13:30 - 15:30</b>	<b>TS2-GP</b>	<b>Geotechnical Performance of Offshore Structures</b> <span style="float: right;"><b>Venue: Library Building</b></span> <i>Chairs: Pauline Suzuki &amp; Linlin Wang</i>
13:50 - 14:00	GP01	› Fractured reservoirs modeling by Embedded Fracture Continuum Approach: field-scale applications - <i>Hong-Lam Dang (1), Duc-Phi Do, Dashnor Hoxha; (1) Univ. of Transport and Communication, Civil Engineering Faculty., Univ. Orléans, Univ. Tours, INSA CVL, Lamé, EA 7494, FRANCE</i>
14:00 - 14:10	GP02	› Evolution of riser-soil stiffness in a soil crust layer - <i>Zhechen Hou (1), Fauzan Sahdi, Christophe Gaudin, Mark Randolph ; (1) Centre for Offshore Foundation Systems, The University of Western Australia, AUSTRALIA</i>
14:10 - 14:20	GP03	› Improvement of NT-bar Evaluation in Clays Using Large Deformation FE Method - <i>Dat Vu Khoa Huynh (1), Hans Petter Jostad, Harun Kursat Engin; (1) Norwegian Geotechnical Institute, NORWAY</i>
14:20 - 14:30	GP04	› Analysis of Induced Overconsolidation on Response of Granular Pile Reinforced Soft Ground- Effect of Relative Compressibility - <i>K. Suresh (1), M. R. Madhav, E. C. Nirmala Peter; (1) JNTU Hyderabad, INDIA</i>
14:30 - 14:40	GP05	› Examination of caisson type quay wall for resilient structure by 1G shaking table test - <i>Kazuhiro Kaneda (1), Hiroyuki Yamazaki, Satoru Ohtsuka; (1) Takenaka Corporation, JAPAN</i>
14:40 - 14:50	GP06	Investigation on Seepage Erosion and Safety Mechanism of Suction Caisson Installation - <i>Kanmin Shen, Zhen Guo (1), Lizhong Wang, Shengjie Rui, Ben He; (1) Zhejiang University, CHINA</i>
14:50 - 15:00	GP07	› On The Use Of Armour Block-RAKUNA IV In Break- waters And Coastal Protection Works In Vietnam - <i>Thi Huong Giang Le (1); (1) Vietnam Maritime University, VIETNAM</i>
15:00 - 15:10	GP08	› Application of a geomechanical model to wellbore stability analysis: A case study X-Well, Bach Ho field in Vietnam - <i>Van Hung Nguyen (1), Hai Linh Luong, Minh Hoang Truong, Huu Truong Nguyen, Vu The Quang, Viet Khoi Nguyen Nguyen, Tu An Bui; (1) Petrovietnam University, VIETNAM</i>
15:10 - 15:20	GP09	› Numerical study of flint/boulder behavior during pile driving - <i>Emilio Nicolini (1), Paolo Gargarella; (1) Cathie Associates, FRANCE</i>
15:20 - 15:30	GP10	› Scour around a subsea structure with mudmat: comparison of field data with laboratory experiments - <i>Weidong Yao (1), Scott Draper, Phil Watson, Hongwei An, Liang Cheng, Meysam Banimahd; (1) The University of Western Australia, AUSTRALIA</i>
<b>15:30 - 16:00</b>	<b>Break</b>	<b>Coffee break</b>
<b>16:00 - 18:00</b>	<b>TS3-OS</b>	<b>Design of Offshore Structures</b> <span style="float: right;"><b>Venue: G3 Building</b></span> <i>Chairs: Christophe Gaudin &amp; Tran Long Giang</i>

TIME	CODE	EVENT
16:00 – 16 :20	OSi	<b>Invited lecture 3: Development of Offshore Structural Analysis and Design Software, X-SEA, for Oil/Gas and Wind Turbine Platform, Ki-Du Kim, Konkuk University, REPUBLIC OF KOREA</b>
16:20 - 16:30	OS01	› Experimental investigation of elasticity effects on slamming - <u>Tri Mai</u> (1), Alison Raby, Deborah Greaves; (1) National University of Civil Engineering, Plymouth University, UNITED KINGDOM
16:30 - 16:40	OS02	› Hydroelastic Analysis of Modular Floating Barge System for Hydrocarbon Storage Facility - <u>Jian Dai</u> (1), Kok Keng Ang, Chi Zhang; (1) National University of Singapore, SINGAPORE
16:40 - 16:50	OS03	› Dynamic effects of wave loads in analysis to check strength and fatigue for fixed steel jacket structure - <u>Quang Cuong Dinh</u> , <u>The Anh Bui</u> (1), Duc Nien Hoang; (1) NUCE, VIETNAM
16:50 - 17:00	OS04	› Offshore Gas Pipeline Linepack To Improve The Flexility Of System Facilities - <u>Quang Khanh Do</u> (1), Cong Vinh Luan Dinh, Truc Doan, Thi Mai Huong Tran, Huu Nhan Nguyen; (1) Faculty of Geology and Petroleum Engineering, Bach Khoa University (BKU), Vietnam National University - HoChiMinh City, VIETNAM
17:00 - 17:10	OS05	› Fatigue of K joints – review and outlook - <u>Jennifer Hrabowski</u> , <u>Stefan Herion</u> (1); (1) KoRoH GmbH - Center of Competence for Tubes and Hollow Sections, GERMANY
17:10 - 17:20	OS06	› Coupled BEM/ hp -FEM Modelling of Moored Floaters - <u>G. Moura Paredes</u> (1), C. Eskilsson, J. Palm, J. P. Kofoed, L. Bergdahl; (1) Aalborg University, DENMARK
17:20 - 17:30	OS07	› Design of Station-keeping System for a 12 MW Semi-submersible Floating Offshore Wind Turbine - <u>Pham Thanh Dam</u> (1), Byoungcheon Seo, Junbae Kim, Hyeonjeong Ahn, Dongju Kim, Hyunkyong Shin; (1) Naval Architecture and Ocean Engineering, University of Ulsan, REPUBLIC OF KOREA
17:30 - 17:40	OS08	› The Influence of Flexible Towers on the Dynamics of Offshore Wind Turbine Gravity Base Structures - <u>Kieran O'Leary</u> (1), Vikram Pakrashi, Denis Kelliher; (1) MaREI Centre for Marine and Renewable Energy, University College Cork, IRELAND
17:40 - 17:50	OS09	› Safety assessment of fixed steel offshore structures when suffering over-design environmental loading in Vietnamese sea conditions - <u>Vu Dan Chinh</u> (1); (1) VIETNAM
17:50 - 18:00	OS10	› Comparison Study on Hydrodynamic Response of Two Concepts for Single Hydrocarbon Storage Tank - <u>Chi Zhang</u> , <u>Jian Dai</u> , <u>Kok Keng Ang</u> (1), Allan Magee; (1) National University of Singapore, SINGAPORE
<b>16:00 - 18:00</b>	<b>TS4-F1</b>	<b>Design of Offshore Foundations</b> <span style="float: right;"><b>Venue: G3 Building</b></span> <i>Chairs: Harvey Burd &amp; Nguyen Tat Thang</i>
16:00 - 16:20	F1i	<b>Invited lecture 4: Decommissioning of offshore structures and foundations, Mai Hong Quan, Dean of Coastal &amp; Offshore Engineering Faculty, NUCE, VIETNAM</b>
16:20 - 16:30	F101	› Suction Pile Design and Installation Challenges for the Ophir WHP - <u>E. A. Alderlieste</u> (1), M. J. Dekker, SPT Offshore BV; (1) THE NETHERLANDS
16:30 - 16:40	F102	› Numerical Analysis of Suction Bucket Foundations used for Offshore Wind Turbines- <u>Pouyan Bagheri</u> (1), Jong Chan Yoon, Duhee Park, Jin Man Kim; (1) Pusan National University - Jong Chan Yoon, Pusan National University, REPUBLIC OF KOREA
16:40 - 16:50	F103	› Development of Semi Empirical Method for Predicting Axial Pile Capacity - <u>Amel Benali</u> (1), Ammar Nechnech, Ali Bouafia; (1) University of Djilali Bounaama, Khemis Miliana, ALGERIA
16:50 - 17:00	F104	› Study of the stability and behavior of an artificial energy atoll at the Belgian coast - <u>Herman Peiffer</u> (1); (1) Professor Technologiepark 905 - B9052 Zwijnaarde, BELGIUM

TIME	CODE	EVENT
17:00 - 17:10	F106	› Life cycle changes in p-y stiffness for a conductor pile installed in carbonate silt - <i>James Doherty, David White, <u>Phillip Watson</u> (1), Andrew Grime; (1) The University of Western Australia, AUSTRALIA</i>
17:10 - 17:20	F107	› Undrained penetration using rate-dependent and strain-softening Tresca model for offshore geotechnical problems - <i>Erick Y. <u>Kencana</u> (1), C. F. Leung, Y. K. Chow; (1) National University of Singapore, SINGAPORE</i>
17:20 - 17:30	F108	› Reliability based installation design of suction caissons in clay - <i>Michael <u>Harte</u> (1), Avi Shonberg; (1) Orsted (formerly DONG Energy), UNITED KINGDOM</i>
17:30 - 17:40	F109	› Investigation of vertical pullout cyclic response of bucket foundations in saturated loose sand - <i>Le Chi Hung, Sihoon Lee, <u>Sung-Ryul Kim</u> (1), Xuan Nghiem Tran, Tien Dung Nguyen, Ju-Hyung Lee; (1) Seoul National University, REPUBLIC OF KOREA</i>
17:40 - 17:50	F110	› Numerical Analysis on Behaviours of Winged Monopile Subjected to Cyclic Loading in a Calcareous Ground - <i>Anh-Tuan <u>Vu</u> (1), Tatsunori Matsumoto; (1) Le Quy Don Technical University, VIETNAM</i>

**19:00 - 21:00**

**GALA DINNER**

## Day 2 (02 November 2018)

TIME	CODE	EVENT
08:00 onwards		REGISTRATION
<b>08:30 – 09:00</b>	<b>OC</b>	<b>Opening Ceremony</b> <span style="float: right;"><b>Venue: G3 Building</b></span> <i>Chairs: Dr. Doan Hong (AVSE Global, SUBSEA 7, FRANCE)</i> <i>Dr Nguyen Tien Dung (NUCE, VIETNAM)</i>
<b>08:30 – 08:35</b>		Prof. Pham Duy Hoa (Rector of NUCE, VIETNAM) Prof. Nguyen Duc Khuong (President of AVSE Global, FRANCE)
<b>08:35 – 08:45</b>		His Excellency Dr Tran Hong Ha, Minister of Natural Resources and Environment, VIETNAM
<b>08:45 – 08:55</b>		Her Excellency Ms Cait Moran, Ambassador of Ireland to Vietnam
<b>08:55 – 09:00</b>		Dr Bui The Duy, Deputy Minister of Science and Technology, VIETNAM (TBC)
<b>9:00 – 10:00</b>	<b>KL</b>	<b>Keynote Lectures</b> <span style="float: right;"><b>Venue: G3 Building</b></span> <i>Chairs: Don DeGroot &amp; Van Nguyen Dinh</i>
<b>09:00 – 09:25</b>	<b>KL4</b>	<b>Keynote 4 : Policy changes toward offshore energy and energy security for Vietnam - Ta Dinh Thi, Director General, Vietnam Administration of Seas and Islands</b>
<b>09:25 – 10:00</b>	<b>KL5</b>	<b>Keynote 5 : Fossil energy: Technology opportunities and challenges – Nguyen Hong Minh, Vietnam Petroleum Institute, VIETNAM</b>
<b>10:00 – 10:30</b>		<b>Coffee break</b>
<b>10:30 - 12:00</b>	<b>TS5-F2</b>	<b>Design of Offshore foundations</b> <span style="float: right;"><b>Venue: G3 Building</b></span> <i>Chairs: Angelo Lambrughì &amp; Trung Le Thiet</i>
<b>10:30 – 10 :50</b>	<b>F2i</b>	<b>Invited lecture 5: PISA: Recent Developments in Offshore Wind Turbine Monopile Design - Harvey Burd, University of Oxford, UNITED KINGDOM</b>
10:50 - 11:00	F201	› Numerical investigation of installation effects on the cyclic behaviour of monopile foundation under horizontal loading - <u>Viet Hung Le (1)</u> , Fabian Remspecher, Frank Rackwitz; (1) Technische Universität Berlin, Faculty Planning Building Environment, Chair of Soil Mechanics and Geotechnical Engineering, GERMANY
11:00 - 11:10	F202	› Ultimate Lateral Resistance of Pile Group in Clayey Soils against Various Directions of Ground Movement - <u>Quang N. Pham (1)</u> , Satoru Ohtsuka, Koichi Isobe, Yutaka Fukumoto; (1) Nagaoka University of Technology, JAPAN
11:10 - 11:20	F203	› Influence of layered soil profiles on the application of p-y curves for large diameter monopiles - <u>Pauline Suzuki (1)</u> , David Maloney, Liv Hamre; (1) DNV GL, NORWAY
11:20 - 11:30	F204	› Grouted connections on monopiles: A numerical study - <u>Nikolaos I. Tziavos</u> , Hassan Hemida, Nicole Metje, <u>Charalampos Baniotopoulos (1)</u> ; (1) University of Birmingham, UNITED KINGDOM
11:30 - 11:40	F205	› Heat Transfer in Gas Hydrate Sediment- <u>Zhiqiang Liu (1)</u> , Linlin Wang; (1) China University of Petroleum, CHINA
11:40 - 11:50	F206	› Driven pile design for offshore wind jacket structures - <u>Sebastien Manceau</u> , Anna Sia, Robert McLean, <u>Angelo Lambrughì (1)</u> ; Atkins Ltd, UNITED KINGDOM

TIME	CODE	EVENT
11:50 - 12:00	F207	› PREDIN - a preliminary design tool for offshore wind turbine foundations - <i>Félix Gorintin (1), Hélène Robic, Antoine Neau, Hakim Mouslim, Bruno Borgarino; (1) INNOSEA - Hakim MOUSLIM, INNOSEA, FRANCE</i>
<b>10:30 - 12:00</b>	<b>TS6-E1</b>	<b>Offshore Energy</b> <span style="float: right;"><b>Venue: Library Building</b></span> <i>Chairs: Nicolini Emilio &amp; Pham Huy Giao</i>
<b>10:30 - 10 :50</b>	<b>E1i</b>	<b>Invited lecture 6: Study of the macro-economic effects of a high proportion of renewable energy in Viet Nam's future electricity mix - <i>Nguy Thi Khanh, Green ID, VIETNAM</i></b>
10:50 - 11:00	E101	› Analytical investigation on hydrodynamics of a concentric cylindrical OWC wave energy converter - <i>Dezhi Ning (1), Yu Zhou, Chongwei Zhang, Bin Teng; (1) State Key Laboratory of Coastal and Offshore Engineering, Dalian University of Technology, CHINA</i>
11:00 - 11:10	E102	› Suitability of helical anchors for mooring a wave energy converting system - <i>Kerstin Lesny (1), Matthias Uchtmann; (1) HafenCity University Hamburg, Geotechnical Engineering, GERMANY</i>
11:10 - 11:20	E103	› Numerical investigation of wave-current interaction by using Smoothed Particle Hydrodynamics method - <i>Hoa Xuan Nguyen (1), Biswajit Basu, Van Nguyen Dinh; (1) Trinity College Dublin, IRELAND</i>
11:20 - 11:30	E104	› Numerical simulation of a wave energy converter using linear generator - <i>Van Ngoc Phung (1), The Mich Nguyen, The Ba Dang, Dinh Tuan Phan; (1) VAWR, VIETNAM</i>
11:30 - 11:40	E105	› Improved Interface Capturing for Ship Hydrodynamics and Multiphase Flow Simulation - <i>Tat Thang Nguyen (1), Vu Phuong Thao Luu, Duy Trong Nguyen; (1) Institute of Mechanics, Vietnam Academy of Science and Technology, VIETNAM</i>
11:40 - 11:50	E106	› Potential Application of Slimhole Drilling Technology to Geothermal Wells in Vietnam - <i>Quang Khanh Do (1), Truc Doan, Trong Quang Hoang, Thi Tam Thanh Nguyen, Tam Tran; (1) Faculty of Geology and Petroleum Engineering, Bach Khoa University (BKU), Vietnam National University - HoChiMinh City, VIETNAM</i>
11:50 - 12:00	E107	› The mechanism of after-runner storm surge along the north coast of vietnam - <i>Ba Thuy Nguyen (1), Ngoc Khanh Pham, Manh Dung Nguyen, Sooyoul Kim, Lars Robert Hole; (1) National Hydrometeorological Forecasting Center, VIETNAM</i>
<b>12:00 - 13:30</b>	<b>Break</b>	<b>Lunch</b>
<b>13:30 - 15:30</b>	<b>TS7-F3</b>	<b>Design of Offshore foundations</b> <span style="float: right;"><b>Venue: G3 Building</b></span> <i>Chairs: Phillip Watson &amp; Anh Minh Nguyen</i>
13:30 - 13:40	F301	› Challenges of Life Extension for Offshore Structures and Foundations - <i>Fion Yong (1), Neil Morgan; (1) Lloyd's Register, MALAYSIA</i>
13:40 - 13:50	F302	› Application of numerical modeling for the dyke erosion in Trieu Do Commune on Thach Han River basin in Vietnam - <i>Hong Thai Tran, Quang Tri Doan (1); (1) Sustainable Management of Natural Resources and Environment Research Group, Faculty of Environment and Labour Safety, Ton Duc Thang University, Ho Chi Minh City, VIETNAM</i>
13:50 - 14:00	F303	› Impact of holes in offshore pile foundation on internal force distribution - <i>L. G. Tran (1), T. D. C. Nguyen; (1) Vietnam Maritime University, VIETNAM</i>
14:00 - 14:10	F304	› Vibratory driven installation of monopiles - an experimental investigation of the soil-pile interaction - <i>Fabian Remspecher (1), Viet Hung Le, Frank Rackwitz, Volker Herwig, Benjamin Matlock; (1) Technische Universität Berlin, Faculty Planning Building Env, GERMANY</i>



TIME	CODE	EVENT
14:10 - 14:20	F305	› Modelling of soil-pile interaction for monopiles for offshore wind turbines: Back-calculation of eigenfrequencies - <i>Martin Underlin Østergaard, Anders Hust Augustesen (1), Søren Peder Hyldal Sørensen, Claus Kramhøft, Mikkel Traberg Larsen; (1) Orsted, DENMARK</i>
14:20 - 14:30	F306	› Tubular, lattice and hybrid steel turbine towers for offshore wind energy. A numerical investigation. - <i>Nafsika Stavridou (1), Efthymios Koltzakis, Charalampos C. Baniotopoulos; (1) Stavridou Nafsika</i>
14:30 - 14:40	F307	› Methodology for total reliability evaluation of the mooring lines of floating offshore structures - <i>Hien Hau Pham (1); (1) National University of Civil Engineering, VIETNAM</i>
14:40 - 14:50	F308	› New Structural Solution For Port Protective Works: Rubble Mound Breakwater Slope - <i>Van Ngoc Nguyen (1), Thi Huong Giang Le; (1) Vietnam Maritime University, VIETNAM</i>
15:00 - 15:10	F309	› Hollow cylinder breakwater for dissipation of wave energy to protect the west coast of Ca Mau province in Vietnam - <i>Van Thai Tran, Hai Ha Nguyen (1), Duc Hung Pham, Duy Ngoc Nguyen, Thanh Tam Nguyen; (1) Hydraulic construction Institute, VIETNAM</i>
15:10 - 15:20	F310	› New structural solution for breakwater combined of fibre reinforced polymer (FRP) concrete framework and FFP concrete plate constructed on weak soil - <i>Long Giang Tran (1); (1) Vietnam Maritime University, VIETNAM</i>
<b>13:30 - 15:30</b>	<b>TS8-E2</b>	<b>Offshore Energy</b> <span style="float: right;"><b>Venue: Library Building</b></span> <i>Chairs: Joana Fonseca &amp; Hong Quan Mai</i>
<b>13:30 - 13:50</b>	<b>E2i</b>	<b>Invited lecture 7: Offshore wind measurement techniques and projects - Christiaan Homann, Mainstream Renewable Power (THE PHILIPINES &amp; IRELAND)</b>
13:50 - 14:00	E201	› Constructing the map of offshore wind energy potential along the coast of Vietnam - <i>Quang Van Doan (1); (1) SINGAPORE</i>
14:00 - 14:10	E202	› Offshore wind power: Lessons learnt from Phu Quy and Bac Lieu wind farm - <i>Hong Thai Vo (1), Viet Trung Le, Le Mai Phung, Thi Thu Hang Cao; (1) Vietnam Petroleum Institute, VIETNAM</i>
14:10 - 14:20	E203	› The zoning of offshore wind energy in the Vietnam Sea - <i>Du Van Toan, Quang Van Doan (1), Pham Le Duy Anh, Van Nguyen Dinh; (1) SINGAPORE</i>
14:20 - 14:30	E204	› Design of an Offshore Wind Farm Layout - <i>Van Nguyen Dinh, Hoa Xuan Nguyen (1); (1) Trinity College Dublin, IRELAND</i>
14:30 - 14:40	E205	› Aerodynamic analysis of a 5 MW stall-regulated offshore vertical axis wind turbine using computational fluid dynamics - <i>Brian Hand (1), Andrew Cashman, Ger Kelly; (1) Cork Institute of Technology, IRELAND</i>
14:40 - 14:50	E206	› VC4OWT: MATLAB Interface for Vibration Control of Offshore Wind Turbine - <i>Thanh-Tuan Tran (1, 2), Anh-Tuan Cao, Dookie Kim; (1) Kunsan National University, REPUBLIC OF KOREA, (2) Quy Nhon University, VIETNAM</i>
14:50 - 15:00	E207	› Design a small direct drive wind power generator - <i>The Cong Nguyen (1), Tuan Vu Tran, Duc Bac Nguyen; (1) Hanoi University of Science and Technology, VIETNAM</i>
15:00 - 15:10	E208	Development of an International Graduate Program in Smart Energy Resources Exploration and Engineering, <i>Pham Huy Giao; Asian Institute of Technology, THAILAND</i>
15:10 - 15:20	E209	› Pipeline flow assurance: A case study of oil with high paraffin concentration in Vietnam - <i>Van Hung Nguyen (1), Hai Linh Luong, Huu Truong Nguyen, Minh Hoang Truong, Vu The Quang, Pham Huu Tai; (1) Petrovietnam University, VIETNAM</i>

TIME	CODE	EVENT
15:20 - 15:30	E210	› Methane hydrate-bearing sand - An energy resource? - <i>Thi Xiu Le (1), Anh Minh Tang, Patrick Aïmedieu, Michel Bornert, Baptiste Chabot, Stéphane Rodts; (1) Laboratoire Navier/CERMES, FRANCE</i>
<b>15:30 - 16:00</b>	<b>Break</b>	<b>Coffee break</b>
<b>16:00 - 17:20</b>	<b>KL</b>	<b>Keynote Lectures &amp; Closing</b> <span style="float: right;"><b>Venue: G3 Building</b></span> <i>Chairs: Nick Ramsey &amp; Man Bui</i>
16:00 - 16:25	KL6	<b>Keynote 6 : Renewable energy: Technology opportunities and challenges - Eamon McKeogh/Van Nguyen Dinh, MaREI Centre for Marine and Renewable Energy, University College Cork , IRELAND</b>
16:25 - 16:45		<b>Assoc. Prof. Trieu Hung Truong, Vice Rector, Hanoi University of Mining and Geology</b>
16:45 - 17:30	CC	<b>Closing ceremony - Mark Randolph, University of Western Australia, Centre for Offshore Foundation Systems, AUSTRALIA</b>

## Day 3 (3 November 2018)

TIME	TYPE	EVENT
08:30 - 18:00	Tour	Social program

## Keynote speakers

### His Excellency Dr Tran Hong Ha

Minister of Natural Resources and Environment (MONRE) of Vietnam



April 2016 to present: Minister of MONRE

July 2010 to March 2016: Deputy Minister of MONRE

2009 - 2010: Vice Secretary of the Party Committee of Ba Ria - Vung Tau province

July to December 2008: Deputy Minister of MONRE

April to May 2008: Acting Director General, Vietnam Environment Administration, MONRE

2004 to 2008: Director General of Vietnam Environment Protection Agency, MONRE

2002 to 2003: Deputy Director General of Vietnam Environment Protection Agency, MONRE

2000 to 2001: Head of Policy and Legislation Division, National Environment Agency, MOSTE

1999 to 2000: Deputy Chief of Policy and Legislation, National Environment Agency, MOSTE

1996 to 1998: Official of National Environment Agency, MOSTE

1992 to 1996: Technical Officer at Center for Supporting Information and Electronic Science Development

Education History

- Public Administration Programme (Tokyo, Japan);
- Viet Nam Executive Leadership Programme (Harvard Kennedy School of Government, US);
- PhD of Mineral Technology and Management (Moscow, Russia);
- Bachelor of Mineral Technology and Management (Moscow, Russia).

### Her Excellency Ms Cáit Moran

Ambassador of Ireland to Vietnam



Ms Cáit Moran is Ambassador of Ireland to the Socialist Republic of Vietnam and holds non-resident accreditations to Lao People's Democratic Republic and the Kingdom of Cambodia.

Cáit joined the Irish Department of Foreign Affairs in 1998 as a Third Secretary, serving in the European Union Division. In 1999 she was posted to the Consulate General of Ireland in New York as Vice Consul. In 2003 she took up the position of Assistant Chief of Protocol in Departmental HQ in Dublin.

In 2005 she became Deputy Director of the Emergency and Recovery Section of the Development Cooperation Directorate (Irish Aid) in Dublin.

In 2007 she was appointed as Head of Development at the Embassy of Ireland in the Republic of South Africa with responsibility for Irish Aid programmes in South Africa and Zimbabwe.

In 2012 she returned to Dublin to take up the position of Counsellor leading Irish Aid's Hunger, Climate Change and Global Health engagement.

In 2014, she was appointed Humanitarian Director in the Department of Foreign Affairs and Trade and led Ireland's preparations for the Global Humanitarian Summit and the launch of a new Irish Humanitarian Policy.

In 2015 she was nominated to be Ireland's Ambassador to the Socialist Republic of Vietnam, with non-resident accreditations to the Lao People's Democratic Republic and the Kingdom of Cambodia.

Cait Moran holds a Bachelor of Civil Law Degree from University College Cork and a Master's degree in Human Rights and Emergency Law from Queen's University, Belfast in 1996. Following graduation and prior to joining the Diplomatic Service she spent two years working in the non-governmental sector in Brussels, where her work included supporting European Union programmes on the promotion of human rights. She speaks fluent Irish, has working French and Spanish and is learning Vietnamese.

## Ta Dinh Thi

General Director, Vietnam Administration of Seas and Islands, VIETNAM

Lecture: KL4 - *Policy changes toward offshore energy and energy security for Vietnam*

## Mark Randolph

Professor at the University of Western Australia, Centre for Offshore Foundation Systems.

Fellow of the Australian Academy of Science, Fellow of the Royal Academy of Engineering.



Prof. Mark Randolph holds the Fugro Chair in Geotechnics in the Centre for Offshore Foundation Systems at the University of Western Australia. His two main research interests are piled foundations and offshore geotechnics, co-authoring books in each area: *Piling Engineering*, now in its third edition, and *Offshore Geotechnical Engineering*. His research has embraced centrifuge model testing, numerical analysis and plasticity solutions, with a primary on developing simplified models of analysis that are suitable for application. These have included various pieces of software for analysis and design of piles and pile groups.

Professor Randolph interacts closely with industry, both in research and through his role as Technical Advisor within Fugro AG. He is a Fellow of several learned academies, including the Royal Society and the Australian Academy of Science, and in 2013 was elected Scientist of the Year in Western Australia. In 2015 he received an honorary doctorate from ETH Zurich.

## Nick Ramsey

GeoConsulting Leader, Fugro GeoConsulting, East Australia

Lecture: KL1 - *Marine site characterisation*



Nick has more than 30 years offshore geotechnical experience; his particular interest is the integration of geophysical, geological and geotechnical information to produce cost-effective and project-specific ground models for engineering purposes.

Nick has been Fugro's lead geotechnical engineer and/or project manager on numerous geotechnical projects throughout the world - including projects offshore UK, Norway, Africa, Brazil, Australia, Indonesia, Russia, Bangladesh, New Zealand, Gulf of Mexico and Caspian Sea. Nick's extensive international experience includes offshore site investigations, advanced laboratory testing, advanced geotechnical site characterization and ground model development, and the geotechnical design of offshore foundations.

## Lars Andresen

Ph.D., Managing Director, Norwegian Geotechnical Institute (NGI), Norway

Lecture: KL2 - *Recent advances in offshore foundation design*



Dr Andresen has expertise within numerical and constitutive modelling for a broad range of geomechanical problems. He has 23 years of experience working as a consultant and researcher at NGI. Projects have included design of anchors and foundations for offshore structures, design of support systems for deep excavations in soft soil, analysis of progressive failure and localisation of sensitive clay, analysis of tailing dams.

Since 2007 he has been in the management group of NGI and since 2012 NGI's CEO and Managing Director. Dr Andresen is a member of ISSMGE TC103 Numerical modelling since 2011 and ISSMGE TC207 Soil-Structure Interactions in 2011-2015 and a board member of the Association of Consulting Engineers Norway in 2014 – 2016.

He obtained an MSc in Civil Engineering from Norwegian University of Science and Technology, Trondheim, Norway and a PhD in Geology from the University of Oslo, Norway in 2002. He has been an author and co-author of more than 50 articles published in journals and conferences.

## Ian Hatton

Chairman, Founder Director, Enterprize Energy, UK

Lecture: KL3 - *Bluewater Offshore Wind Energy for Vietnam – Challenges and Opportunities*



Ian Hatton is Chairman and Founder of Enterprize Energy, a company focused on low-carbon energy project development in the transition to a fully renewable energy based global economy. He is a petroleum geologist by profession and from 1979 held senior positions in exploration and development with Phillips Petroleum and Kerr-McGee, successfully exploring for oil and gas in NW Europe.

In 1999 he founded Enterprize Energy's innovative forerunner company Eclipse Energy conceiving the UK's Ormonde Offshore Wind Farm, the first commercial project to utilize 5 MW turbines on 'jacket-type' substructures.

In 2009 he founded Singapore-based Enterprize Energy following the acquisition of Eclipse by Vattenfall in October 2008. He spent five years developing onshore and offshore wind projects for subsidiary Baryonyx Corporation in Texas and was a US Department of Energy Principle Investigator in respect of a pilot offshore wind farm in the hurricane -prone US Gulf of Mexico.

This led Enterprize to investigate development in the challenging Taiwan Strait offshore Taiwan where it originated the Hai Long Offshore Wind Farm in Taiwan, a 1,044 MW project, introducing partners Northland Power and most recently Mitsui. It has originated the Ke Ga Offshore Wind Project, Vietnam projected as a multi-phased development of 2,400MW.

Completing an evolutionary cycle, Enterprize has recently returned to the UK with plans for a new natural gas / offshore wind development based on the undeveloped Bedevere Gas Field and nearby suspended Anglia Gas Fields in the Southern North Sea where it plans to 're-purpose' the fields as part of an overall concept to transform near life-end gas fields into an offshore hub for renewable energy.

## Nguyen Hong Minh

Deputy General Director, Vietnam Petroleum Institute, Vietnam

Lecture: KL5 - *Fossil energy: Technology opportunities and challenges*



Dr. Minh obtained PhD in geophysics from the Moscow Geological Prospecting University, in 1995, and Executive MBA in International Business and Technology Management from Asian Institute of Technology, in 2001. He has more than 20 years experiences in geophysical data interpretation, data management and research.

Dr. Minh had been involved in several research and international cooperation projects for capacity building in geosciences for Vietnam Petroleum Institute (VPI) as well for the Member Countries of The Coordinating Committee for Geoscience Programmes in East and Southeast Asia (CCOP). Currently, he is Deputy General Director of the VPI, in-charge of training and human resources development, economic and management studies. In recent years, he had been actively participating in some strategic studies including corporate development strategy and strategy for training and human resources development, and strategy for technology development for Vietnam National Oil & Gas Group.

## Eamon McKeogh

Lecture: KL6 - *Renewable energy: Technology opportunities and challenges*

Ph.D., MaREI Centre for Marine and Renewable Energy, University College Cork (UCC), Ireland



Dr Eamon McKeogh is a Vice Director of the Centre for Marine and Renewable Energy Ireland (MaREI Centre), which is supported by Science Foundation Ireland and consisting of over 200 researchers working across six academic institutions collaborating with over 45 industry partners. He is also a Senior Lecturer in the Department of Civil & Environmental Engineering and the Director of the Sustainable Energy Research Group at University College Cork (UCC), Ireland. Dr McKeogh graduated with a BScEng (1974) and a PhD (1978) from Queens University Belfast and an MBA (1986) from UCC.

He has been involved in research for more than 35 years. His research activities include offshore wind, wind farm development, wind energy forecasting, communication systems for hydropower stations and pumped storage.

He has been a Chartered Engineer Institute of Engineers of Ireland since 1998 and actively collaborating with the industry and government bodies. He has managed over 10 EU funded RTD projects. He provided input to the EU Green Paper on Renewable Energy Sources, a consultation document used to prepare the EU White Paper.

At national level, positions held included the Vice-chair of the Renewable Energy Strategy Group, Chairman of the Grid Connection Working Group, and Vice-chair of the Technology Foresight Energy Panel, National Director at the Renewable Energy Office of the Irish Energy Centre.

At university level, Dr McKeogh established the immensely successful taught Masters (MEngSc) programme in Sustainable Energy in 2005, the first of its kind in Ireland, and co-created of the new BE in Energy Engineering in Ireland in 2007.

## Van Nguyen Dinh

Ph.D., Offshore Wind Manager, MaREI Centre for Marine and Renewable Energy, UCC, Ireland



Dr Van Nguyen Dinh is managing EirWind – a multi-disciplinary research in development of the Masterplan for Irish offshore wind energy including site survey and data management, cost optimisation, new energy markets, energy storage, logistics, governance and biology. He is leading a team including 14 full time researchers, five work package leaders, and expert representatives of 10 industry partners from six countries.

Dr Dinh obtained a PhD in structural dynamics, won the Mitsui-Sumitomo Insurance Welfare Foundation Research Award, and lectured at Vietnam Maritime University and Konkuk University in Seoul, South Korea. He then worked at PLAXIS – a geotechnical engineering software company in The Netherlands, and at Trinity College Dublin, Ireland on dynamics, modelling and control of offshore wind turbines and wave energy converters; spatially-varying non-stationary excitations and time-frequency analysis; and geotechnical earthquake engineering. He was a senior engineer at Wood – a global leader in offshore and energy services and has been a consultant for several projects in floating platforms, moorings, risers, offshore wind development and turbine technologies.

## Invited Lecture Speakers

### Robert Whittle

Cambridge Insitu Ltd

Lecture: *The use of pressuremeters in the marine environment*



Robert Whittle is part owner of Cambridge Insitu Ltd (CI) and has been associated with the company since 1978. He has a background in electronics and his initial involvement concerned the production of ancillary equipment for the Self Boring Pressuremeter (SBP). As CI evolved into a service provider as well as manufacturer he became an expert in pressuremeter testing and analysis, operating globally on sites extending from remote parts of Africa to the heart of New York. He has worked extensively in Hong Kong and Singapore and has published several conference and journal papers on aspects of the pressuremeter test and interpretation. His particular interest is the stress and strain dependency governing the unload/reload response of soils.

### Kidu Kim

Professor, Department of Civil & Environmental Engineering, Konkuk University, Seoul, South Korea, Vice President of Korean Society of Steel Construction (KSSC),

Chairman of Committee of offshore wind, Korean Society of Civil Engineers (KSCE)

Lecture: *Development of Offshore Structural Analysis and Design Software, X-SEA, for Oil/Gas and Wind Turbine Platform*



Prof. Kim has contributed to research in structural and dynamic analysis and design of offshore structures and foundations. He has led the development of several robust structural dynamic algorithms, nonlinear finite elements, laminate composite and thin-walled elements, pre-stressed concrete elements and successfully applied these in practical structural design. Particularly, he leads the development of the X-SEA supported from Korean government, an integrated finite element structural analysis software that provides for the non linear dynamic analysis and design of offshore steel and concrete structures, including oil and gas structures and wind turbines. The current version of X-SEA includes the results of extensive research and development

base on finite element program X-FINAS, which was originally developed in Imperial College, London. Especially, the US NREL's FAST 8 can be combined with X-SEA environmental load. X-SEA Post-processing can be integrated with GH Bladed.

Prof. Kim graduated with a BEng from Hanyang University, Seoul, Korea; a MEng from the Asian Institute of Technology, Bangkok, Thailand; and a Ph.D from Imperial College London, UK.

### Mai Hong Quan

Dean of Coastal & Offshore Engineering Faculty, National University of Civil Engineering, Vietnam.

Lecture: *Decommissioning of Offshore Structures and Foundations*



Dr Quan achieved PhD degree on Offshore Structure in NUCE (National University of Civil Engineering, Vietnam). He has over 20 years of experiences in researching, teaching and designing fixed steel offshore structures like Jacket, Tripod, Monopile...In Vietnam, he has closely cooperated with companies in oil and gas industry for many years.

His main research interests are fixed steel offshore structures, offshore wind turbines, offshore structural reliability, fatigue analysis of offshore structure, wave loads on offshore wind turbine and applied in oil and gas industry.

## Harvey Burd

MA, D.Phil. MICE, Associate Professor, Department of Engineering Science, Oxford University and Tutorial Fellow at Brasenose College, Oxford, United Kingdom.

Lecture: *PISA: Recent Developments in Offshore Wind Turbine Monopile Design*



Prof. Burd is an Associate Professor in the Department of Engineering Science, Oxford University. For over three decades he has been involved in research on the development of computational modelling techniques for construction processes, reinforced soil structures and foundation engineering problems. He was a member of the PISA project team (2013-2016) on the development of new analysis and design methods for offshore monopile foundations for wind turbine support structure applications. He is currently the Oxford Principal Investigator for an extension to the PISA study (PISA2, 2017-2018) that is currently underway, jointly, with Imperial College, London, with Ørsted as the Lead Partner.

Prof. Burd graduated from Oxford University with a D.Phil. in 1986. He has been a Chartered Civil Engineer (MICE) since 2000. He is currently a member of the advisory panel of the journal *Geotechnique*.

## Nguy Thi Khanh

Executive Director, Green Innovation and Development Centre (GreenID), Vietnam

Lecture: *Study of the Macro-economic Effects of a High Proportion of Renewable Energy in Viet Nam's Future Electricity Mix.*



Ms. Nguy Thi Khanh is currently founder and Executive Director of Green Innovation and Development Centre (GreenID) which is working to promote sustainable energy development, good water and air governance and green development (<http://greenidvietnam.org.vn>). She is the first Vietnamese Goldman Environmental Prize recipient in 2018. She is also the chair of Vietnam Sustainable Energy Alliance and core-members in a number of national and international networks related to sustainable energy, climate change and environment. She has 18 years of experience in integrated community development, network building and advocacy for better Water, Air

Governance and Sustainable energy development in Vietnam and the Mekong region. Since 2012, she has led GreenID to champion local energy planning approach, demonstrate the multiple benefits of sustainable energy solutions for household, community and society. Under her leadership, GreenID supported for more than 20,000 people in different communities in Vietnam having access to clean energy and safe water. She also has good engagement with decision-makers, does multi-stakeholders networking to advocate and support for the energy transition in Vietnam towards more renewable energy, energy efficiency, less dependence on fossil fuel and coal power. Since 2016, she initiated the first Renewable Energy week, which become now an open platform facilitating the experience sharing and promoting good clean energy practices. She believes that clean energy will help Vietnamese people to reduce environmental degradation, restore clean Air and Water.

## Christiaan Homann

Senior Energy Analyst, Mainstream Renewable Power.

Lecture: *Offshore Wind Measurement Techniques and Projects.*



Christiaan is a Senior Energy Analyst and is part of the Energy Analysis team at Mainstream Renewable Power, which consists of seven full-time analysts who provide layout designs, resource measurement and energy assessments for all of Mainstream's wind and solar projects.

Christiaan has completed measurement campaigns and energy estimates for hundreds of megawatts of projects, across various markets in Mainstream's global portfolio. He has been involved in many stages of development, starting from market entry through the development process to financial close and operations.

Christiaan holds a BEng and MEng in Mechanical Engineering from the University of Stellenbosch. He has recently moved to the Philippines to oversee the resource assessments and measurement campaigns for Mainstream's projects in the South East Asia region.



## Sponsors

### Gold Sponsors



NGI (Norwegian Geotechnical Institute, [www.ngi.no/eng](http://www.ngi.no/eng)) is Norway's largest geotechnical specialist community and a leading centre of research and consultancy in engineering-related geosciences. We work within the fields of Offshore energy; Building, construction and transportation; Natural hazards; and Environmental engineering.

We provide comprehensive expertise and services in offshore ground surveys, numerical analysis, foundation engineering, geohazards, geomechanics and CO<sub>2</sub> storage, and subsea technology and instrumented monitoring of structures and processes below, at and above the seabed.

Through our extensive research and expert advice, NGI helps to ensure that we can all live, build and travel on safe ground.



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Establishing as a private foundation in 1983, KICT (Korea Institute of Civil Engineering and Building Technology, [www.kict.re.kr/eng](http://www.kict.re.kr/eng)) has been true to and successful in fulfilling its role in the development of the construction industry. KICT contributes to the development of the Korean construction industry, improves quality of life standards, furthers national economic growth and improves social welfare by resolving the current issues, challenges in construction technology and making bold challenges to future issues, present visions to improve the competitiveness of the homeland and society's potential for innovative growth to allow citizens to live more convenient, safe, and healthy lives.



Cathie Associates (<https://sarathygeotech.com/>) is a leading international geoscience and geotechnical engineering consultancy providing bespoke and objective solutions to the offshore, nearshore and onshore oil, gas and renewable energy industries. Cathie Associates brings an independent and focussed technical engineering expertise and practical construction support to the clients, ensuring seamless service and a range of practical, cost-effective and low risk solutions. Our services include foundation engineering analysis and design; specification, supervision and project management for offshore geotechnical surveys; construction support including cable burial and equipment selection; and pile driving assessment and monitoring. Cathie Associates has been operating for over ten years and has developed an impressive track record in a vast range of offshore and near-shore geotechnical services and solutions. With a highly experienced team of technical experts and proprietary methodologies, we offer robust solutions for infrastructure design development and risk management. Cathie Associates has worked in over two-thirds of all European offshore wind farms including London Array, Le Tréport and Borselle and have over 40GW of experience in offshore wind farm projects worldwide. As a highly specialised consultancy, Cathie Associates has over 40 technical experts operating from offices across Europe (Belgium, France, UK, Germany and Italy) and the USA (Boston and Houston).



Benthic (<https://www.benthic.com/>) is a global leader in offshore geotechnical site investigation and geotechnical engineering, in particular the use of remotely controlled seabed drill rigs for this purpose. Designed and operated by Benthic, the innovative Portable Remotely Operated Drill (PROD) offers proven gains in efficiency, data quality and safety.

Since Benthic's first commercial deployment in 2002, the Company has rapidly established a reputation as a provider of consistent high quality offshore geophysical and geotechnical services. Benthic has grown from a distinctly Australian company to a truly global operator, headquartered in Houston with experience in every major oil-producing region of the world.

The Benthic vision is to be globally recognized as a provider of best-in-class marine geotechnical survey and geoconsulting services, admired for our professionalism and ability to create value for all stakeholders. Benthic will achieve this by attracting the best people, focusing on customer requirements and enthusiastically promoting innovation and creativity at all levels of the organization.

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Lam Pham Construction Company Limited (Lam Pham Construction, or LPC, <http://lpc.vn/en>) was established on 22 August 2007, is an enterprise specializing in design consultation, project planning and management, civil and industrial construction implementation in France and Vietnam. LPC is one of the leading construction companies which transfer and apply technology solutions from Europe on building and implementing construction in Vietnam, typically as Deltabeam – a product of Peikko Group from Finland, lightweight flooring solution – Ubot (Uboot Beton) from Italia. From 2012, LPC has signed an exclusive contract to transfer, market and sell technology products of Daliform Group (Italia) and Peikko Group (Finland). With these new-generation technological solutions, LPC has brought Vietnam's Real Estate and Construction market new solutions which significantly reduce the cost and time, as well as solve limitations of traditional way of building, opening up new options for investors in Vietnam construction.



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- Ports and Harbours
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### National University of Civil Engineering

55 Giai Phong Street, Hanoi, Vietnam

<http://nuce.edu.vn/en>

For **urgent** matter:

DANG Thu Minh (Ms.)

International Cooperation Department

Room 110-111, Building A1

National University of Civil Engineering - NUCE

55 Giai Phong Road, Hai Ba Trung District,

Hanoi, Vietnam

Tel: +84.4.3.869 1302; +84.4.3.869 9403

Fax: +84.4.3.869 1684

Cellphone: +84.(0)988.468 619

