ENGINEERING TIMES

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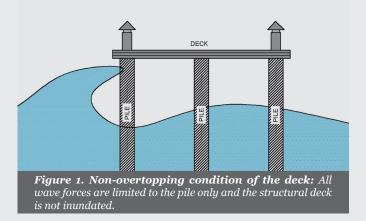
The project on the cover is the Lio North Pier located at El Nido, Palawan. Ten Knots Philippines, Inc. (Ten Knots) thru Makati Development Corporation (MDC) engaged AMH Philippines, Inc. to provide coastal, geotechnical, and structural engineering consultancy services needed for the study, design, and preparation of construction drawings and documents to bring the pier in the Ten Knots Concept Design a reality.

The initial engagement of AMH was to do the following:

- (a) Establish the wave climate in the near-shore area through wave hindcasting, modeling of bathymetric survey data, and numerical simulation for wave refraction, wave diffraction and wave breaking analysis;
- (b) Based on the wave climate established, recommend the best plan-form orientation considering calmness/ roughness of waves, wave distribution, draft availability and vessel requirements;
- (c) Determine the Pier's vertical siting (deck elevation) on the basis of storm tide levels and wave run-up;
- (d) Recommend design parameters and wave loadings as input to detailed design; and
- (e) Develop a conceptual structural design for the Pier, including the structural framing (superstructure), foundation (substructure), and materials to be used for construction.

The results of the study showed that the pier deck elevation indicated in the concept design would be overtopped during design storm conditions, and that raising the deck elevation by two meters would make it free from overtopping. See Figures 1 and 2 at the right.

Such a wave overtopping condition would cause a significant increase in both horizontal and vertical wave forces acting on the deck (See Figure 2). Most piers are designed for non-overtopping condition (See Figure 1).



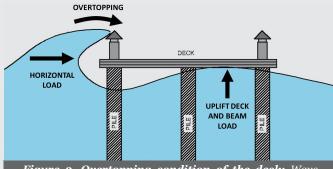


Figure 2. Overtopping condition of the deck: Wave will inundate the deck, creating additional significant forces including uplift from under the deck (impulsive and quasistatic), horizontal loads at the deck side, and downward forces due to waves crashing down on the deck.

However, Ten Knots decided in favor of the configuration in Figure 2 because the low profile was aesthetically pleasing and blends more naturally with the development theme. The additional cost for extra structural elements to withstand the additional stresses was considered acceptable. As such, the additional wave-in-deck forces were included in the analysis to ensure a safe design.

In the next stage of the consultancy engagement, AMH determined the foundation pile requirements based on the geotechnical investigation results, designed the superstructure, and prepared all required bid and construction documents in accordance with the preference and requirements of Ten Knots.

THE ENGINEERING TIMES STAFF

Team Leader: Patrick Robles **Layout:** Ronalie Pangyarihan

Antonio Chua, Jr.

Adviser: Egbert Abiad

Contributors:

Laurenz Luigi Cruz Anne Jeanette De La Rosa Angela Kariza Ines Mon Alvin Margallo Stephanie Martinez Gian Paulo Reyes Hiroshi Ueki Laurice Angeli Villaflor Michael Villaraza Thank you, dear Clients





FEATURED PROJECTS



PROBABILISTIC SEISMIC HAZARD ASSESSMENT FOR THE SEPCC MARIVELES POWERPLANT 2 PROJECT (Mariveles, Bataan)

CLIENT: SHANGHAI ELECTRIC POWER CONSTRUCTION CO. LTD.

Shanghai Electrical Power Construction Co. Ltd. commissioned AMH Philippines, Inc. to conduct a PSHA for the proposed Power Plant located in Mariveles, Bataan. AMH utilized a number of ground motion prediction equations, such as the Fukushima-Tanaka Attenuation Relation and the NGA Relation coupled with AMH-developed MathCAD or MathLab spreadsheets and earthquake hazard modeling software like OpenQuake, to recommend the Peak Ground Acceleration and maximum Pseudo-Spectral Acceleration for the site.



CLIENT: STA. CLARA INTERNATIONAL CORPORATION

Sta. Clara International Corporation (SCIC) contracted AMH as its Civil/Structural Designer for the Water Treatment Plant of the Rizal Provincial Water System Improvement Project. SCIC, in a joint venture with OTV Philippines, was engaged by Manila Water Company, Inc. for the project which forms part of the MWCI expansion in the Rizal Province. AMH undertook plate-based modeling analysis via STAAD Pro v8i by Bentley for major process and non-process structures, including a major reservoir, settlers, a pump station, and dual media filter. When completed, the project is expected to treat up to 50 million liters per day, benefitting more than 400,000 residents in the province.





For the fourth time, AMH successfully passed an ISO audit conducted by SGS Philippines, Inc., one of the world's leading ISO certifying bodies. SGS first certified AMH as an ISO 9001:2008 compliant company in 2014, and subsequently recertified AMH after surveillance audits in 2015 and 2016.

This year 2017, after a documentation audit on October 9, and a two-day implementation audit held on October 19 and 20, SGS upgraded the certification of AMH to ISO 9001:2015. The upgraded certification means that all three of AMH's business processes, CORE, Support, and Mandatory, have adopted the risk based thinking approach to its existing Quality Management System.

The AMH management and staff were jubilant when they learned of the two-day SGS audit results:

Major Non-Conformities: o Minor Non-Conformities: o

(a few of whose logos appear here), for your continued support!





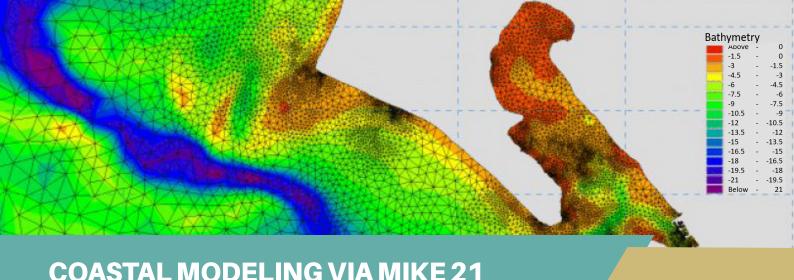












Mathematical modeling, in the recent years, has been widely used to simulate the existing conditions of the coastal environment. In addition, simulation of altered conditions due to implementation of various projects should also be performed. Today, more and more mathematical models are being developed and made available to practicing coastal engineers as computer software packages.

One recent event in Japan demonstrated the importance of this technology in producing safe and sustainable designs. The combined earthquake and tsunami forces that struck the Fukushima Daiichi Nuclear Power Station in 2011 caused large quantities of radioactivity to be released into the environment and over 300,000 residents evacuated from the vicinity of the power plant.

Based on the research made by The Carnegie Papers, the Fukushima accident could have been prevented had the nuclear plant been designed considering the possibility of large tsunamis inundating the surrounding region. The research paper pointed out that improved modeling of tsunami run-up could have provided crucial information to guide risk mitigation. Other phenomena such as the hydrodynamic force of the tsunami and the effects of debris or sediment could have been carried out in the power plant design.

AMH has accumulated substantial experience in the field of Coastal Engineering and continues to look for new tools to provide its clients with the most responsive engineering solutions. AMH acquired its first MIKE 21 license in 2014 and has been utilizing the said software in its various coastal engineering projects such as leisure resorts, piers, and reclamation feasibility studies.

MIKE 21 is a computer program developed by Danish Hydraulic Institute (DHI), an established global organization in the field of water and environmental engineering, specifically for modeling coasts and seas. It can simulate physical, chemical, or biological processes

in the coastal or marine areas using rectangular grid, nested grid or flexible meshes which make it particularly well-suited to handle variable spatial resolution in the model domain. The model includes the main physical phenomena such as wave-wave interaction, whitecapping, dissipation, refraction, and shoaling.

MIKE 21 is composed of several modules: Hydrodynamic (HD) module, Spectral Wave (SW) module, and Boussinesq Wave (BW) module, Sediment Transport (ST), among many others. The Hydrodynamic module solves equations for the conservation of mass and momentum as well as for the salinity and temperature in response to a variety of forcing functions. The Spectral Wave module simulates the growth, decay, and transformation of wind-generated waves and swells in offshore and coastal areas while the Boussinesq Wave module analyzes wave disturbances in ports, harbours, and coastal areas.

Some applications of MIKE 21 include wave forecast and hindcast, offshore wave analysis, storm surge analysis, assessment of hydrographic conditions for design construction and operation of structures in stratified and non-stratified waters, optimization of port layouts and coastal protection measures, and analysis of low-frequency oscillations (seiching and harbor resonance).

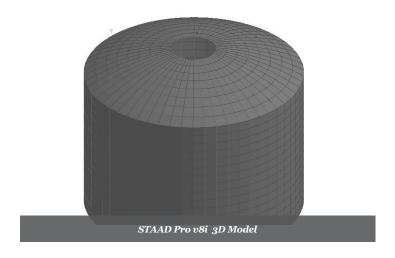


AMH Engineers in Sediment Transport Modelling Seminar with Engr. Lee of DHI Malaysia: Dr. Eric Cruz, Luigi Cruz, Jowi Miranda, Laurice Villaflor, Aragorn Inocencio, Patrick Robles, and Engr. Jack Vun Zac Lee (Trainer)

FINITE ELEMENT METHOD

Finite Element Method (FEM) is a computational tool for performing engineering analysis. It includes the use of mesh generation techniques that involves subdividing a large structure into smaller and simpler parts that are called finite elements, which are then assembled into a larger system of equations that can be used in the design of the entire structure.

The aim of FEM is to calculate the deformation and stresses in a plate subjected to loads. One of the benefits of using the FEM is that it produces comprehensive result sets – generating the actual response of the structure due to loads. It can also provide the designers a more precise location of failures in the structure giving them the right way of modifying the design.



STAAD PRO PLATE ANALYSIS

STAAD Pro v8i by Bentley Systems Inc. is a structural analysis and design software based on FEM. Structures are analyzed using the "Ultimate Strength Design" method specified by the National Structural Code of the Philippines, the American Concrete Institute (ACI 350-06), and the API 650 of the American Petroleum Institute. Seismic loads such as Impulsive & Convective Forces and Wall Inertia Forces are calculated based on the equations specified in ACI 350-06. The API 650 Standard establishes minimum requirements for material, design, and fabrication of storage tanks in various sizes and capacities for internal pressures approximating atmospheric pressures.

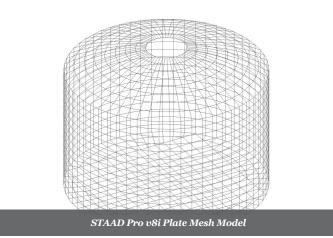
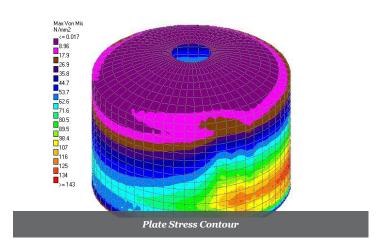


PLATE ANALYSIS FOR STRUCTURAL DESIGN

Traditional analysis approach involves the use of the Strip Method which, though more conservative by applying critical loads on selected strips, does not reflect the actual deformations and stresses. Through its meticulous process, plate analysis allows opportunities for optimization and thus, a more economical design of structures. AMH has been using plate analysis for liquid-containing structures for the past years. Among the numerous projects AMH has done include a biofuel plant in Cavite, water treatment plant in Rizal, and sewage treatment plant in Pasay and Taguig.



66 Through its meticulous process, plate analysis allows opportunities for optimization and thus, a more economical design of structures.

Shareholders

Egbert Abiad Alexis Acacio Edgardo Atanacio Jerome Catbagan Eric Cruz Nathaniel Diola Edsel Edra Mike Follosco Fer Germar Jocy Jocson Jun Ignacio Jon Kasilag Roy Luna Vic Pulmano Ray Quebral Ellen del Rosario Rod Salazar Eric Santos Tonet Tanchuling

Independent Directors: Edgardo Atanacio Mitchay Pacia

Civil Works

Lawrence Chua
Dino Balasbas
Hanna De Leon
Jonil Diaz
Rany Dimaculangan
Philip Fradejas
Amery Fabi
Jennelyn Fernandez
Paul Gaton
Mark Ibañez
Kevin Judit
David Tan

Architecture and **Production**

Avegail Casono Greg De Jesus Marivic Edquila Stephanie Martinez Adrian Notado Vicente Reyes Robert Saguinsin Jem Sumabong Diwa Talisayon Chris Valdez

Structural Engineering

Belle Apelo Randy Camaclang MG Casuncad JR Chua Melai Follosco Rowena Garcia Leslie Gueta Tin Lopez Jean Mantiquilla

Mon Margallo Luis Morillo Fritze Ong Roda Perez Victor Serra Jerome Sy Mabelle Vito Geogy Vizcarra



Times of AMH. Through the years, these Issues have found their way to your hands on the energy of our own Egbert Abiad and a steady stream of young engineers who have shown that they possess creative flair aside from their technical skills.

It is always a joy to be putting out the Engineering

As we continue to showcase our people and projects across industries and various engineering fields, we are grateful for opportunity after opportunity to hone our talents while doing our small share in nation-building. From participation in various conferences and projects to training in globally-used software solutions; from support to graduate student-employees to shareholder

Geotechnical Engineering

Arlene Buenaventura Rodgie Cabungcal Erickson Delos Santos Michael Gargullo Karen Leobrera Jenna Pallarca Joanne Parafina Angel Prellingera Gian Reyes Nicole Tan

Water Resources, Coastal, and Environmental Engineering

Luigi Cruz
Annette De La Rosa
Abigael Gonzales
Brianne Inocencio
Aragorn Inocencio
Jonah Malolos
Jowi Miranda
Ronalie Pangyarihan
Rose Quicho
Suzette Rivera
PJ Robles

Cristelle San Antonio

Industrial Engineering

Karmel Pilones Charm Pontigon

2017 Interns

Aloysius Alipio
Sabrina Buensuceso
Lodette Cunanan
Andrei Dita
Kariza Ines
Patrick Nistal
Isabella Torres
Hiroshi Ueki
Ronald Valdez
Laurice Villaflor

Finance and Accounting

Liza Bares Angelica Bayot Denice Dueñas Jenelyn Poole Mary Grace Quipse

Human Resources

Adrie Rubio Gemalyn Villacorta

Information Technology

George Parel Lord Alvin Sabijon

General Administrative Services

Lina Gamba
Victor Gamba
Serafin Javier
Danny Jumao-As
Allan Malacura
Humer Manjares
Rose Marie Manuales
Melissa Pascua
Michael Teoxon
Tina Virata

ISO - Quality Management System

Mary Valencia



participation in strategic meetings, we continue to push forward to becoming the engineering consultancy company that Filipinos can be proud of.

As we were preparing to roll-out this Issue, I am happy to report that AMH successfully passed the recertification audit for the 2015 version of ISO:9001 accreditation.

Our Quality Management System continues to be a powerful tool in bringing us closer to our vision.

Still a long way to go... but we're getting there.

EDGARDO P. KASILAG II, MTM

President



AMH Engineers with Prof. Ishihara of the University of Tokyo and Dr. Alfaro of the University of Manitoba: (top row): Roy Luna, Eric Santos, Erix Delos Santos, Gian Reyes, Alexis Acacio, Arlene Buenaventura (bottom row): Dr. Marolo Alfaro, Belle Apelo, Gel Prelligera, Joanne Parafina, Jenna Pallarca, Roda Perez, Prof. Kenji Ishihara, Michael Gargullo

CONFERENCES OVERSEAS

19TH ICSMGE 2017 (SOUTH KOREA)

BY GIAN PAULO REYES

AMH Engineers participated in the 19th International Conference on Soil Mechanics and Geotechnical Engineering (ICSMGE) last September 17 – 22, 2017 in Seoul, South Korea. The conference was attended by a wide range of participants, from students to senior engineers and professors, including some of the well-renowned names in the field of geotechnical engineering such as Professors Kenji Ishihara, Izzat Idriss, Ikuo Towhata, Ross Boulanger, Misko Cubrinovski, and David Muir Wood. Of the 1,900 international delegates, seventeen (17) came from the Philippines, with twelve (12) of them from AMH.



AMH Architects with Arch. Miguel Guerrero III (2nd from right): Robert Saguinsin, Chris Valdez, Ezra Sumabong, Diwa Talisayon, and Stephanie Martinez

ARCHXPO 2017 (SINGAPORE)

BY STEPHANIE MARTINEZ

ArchXpo, an international exhibition of architecture and the built environment, is a showcase of relevant technologies and a gathering of industry experts and talents that makes for excellent architectural and built environment design. On its 4th year, ArchXpo 2017 was held in Marina Bay Sands, Singapore and was composed of conferences facilitated by the Singapore Institute of Architects (SIA), lectures series delivered by the United Architects of the Philippines – Singapore Chapter (UAP-Singapore), and a symposium organized by the Real Estate Developers' Association of Singapore (REDAS), among others.

ISOPE 2016 (RHODES, GREECE)

BY LAURENZ LUIGI CRUZ

The ISOPE Conference is an annual conference which covers a variety of fields under coastal, offshore, and polar engineering. The 2016 ISOPE conference held in Rhodes, Greece was attended by more than 50 different countries and composed of 155 technical sessions. AMH presented two technical papers authored by Dr. Eric C. Cruz, Jose Carlo Eric L. Santos, and Laurenz Luigi Cruz:

- Preliminary Engineering of a Seawall against Storm Tides and Waves along a Built-up Waterfront
- Preliminary Engineering of a Cargo Pier and Intake Breakwater of a Power Plant along Mindanao Coast





First Female ICE Director: Ma. Antonia Tanchuling

Dr. Ma. Antonia N. Tanchuling was recently appointed as the new Director of the University of the Philippines Institute of Civil Engineering (ICE). She was officially appointed on September 1, 2017 and her term will last until August 31, 2020. As Director, she will be at the helm of around 700 undergraduate students, 250 graduate students, and 50 faculty members.

Among the many goals she plans to accomplish during her term are to add a Construction Engineering and Management track for MS CE, to propose that ICE become the National Institute of Civil Engineering, to introduce a mentoring program where students are assigned to faculty mentors who will guide them through university life, and continue to improve linkages with the industry. She also

plans to revisit the Institute's research direction and extension agenda in order for the Institute to continue to provide responsive service to the pressing needs of the times, especially those of the undeserved sectors of society.

Dr. Tanchuling graduated with a Bachelor's Degree in Civil Engineering and a Master's Degree in Environmental Engineering from the University of the Philippines, Diliman. She finished her PhD in Civil Engineering at the Tokyo Institute of Technology. She has contributions in various fields such as Waste Management, Sanitation, and Environmental Impact Assessment. On top of these, she teaches courses in Sanitary Engineering, Environmental Engineering, and Geo-Environmental Engineering.

ANNUAL STOCKHOLDERS' MEETING

by Hiroshi Uek



AMH Board of Directors and Shareholders (top row): Michael Follosco, Edsel Edra, Ramon Quebral, Mitchay Pacia, Nathaniel Diola, Lei Lava, Jun Ignacio, Jocelyn Jocson, Edgardo Kasilag II, Jun Viterbo (Legal Counsel), Eric Santos; (bottom row): Edgardo Atanacio, Eric Cruz, Alexis Acacio, Egbert Abiad, Rodolfo Salazar, Ellen Del Rosario, Roy Luna

AMH's 18th Annual Stockholders' Meeting was held last March 27, 2017 at Crowne Plaza Galleria in Ortigas. Seventeen (17) out of nineteen (19) stockholders were present, with the rest having designated proxies to meet the required quorum. Over lunch and drinks, the agenda of the meeting was discussed. Highlights of the meeting include the 2016 Annual Report Presentation by then President Rodolfo C. Salazar and the election of new AMH Directors and Officers.

The newly elected Directors and Officers who will hold office from April 1, 2017 to March 31, 2018 are:

Chairman of the Board: Vice-Chairman of the Board: President: Corporate Secretary: Treasurer:

Director:

Independent Directors:

Rodolfo C. Salazar Eric C. Cruz Edgardo P. Kasilag II Gregorio Tanaka Viterbo, Jr. Jose Carlo Eric L. Santos Roy Anthony C. Luna Adeline A. Pacia Edgardo G. Atanacio



CE 2017 Interns from left to right (top row): Andrei Rafel Dita, Aloysius Kristoffer Alipio, Ronald Valdez, Hiroshi Ueki, Patrick Nistal; (bottom row): Isabella Torres, Angela Kariza Ines, Sabrina Luz Buensuceso, Lodette Cunanan, Laurice Angeli Villaflor

INTERNS BATCH 2017

by Laurice Angeli Villaflor

Some newly-licensed Civil Engineers are attracted to AMH Philippines Inc. because of its internship program. Qualified interns are rotated into different practice-based groups (PBG) such as Water Resources, which includes Coastal and Environmental, Civil Works, Geotechnical and Structural. This is a good opportunity to be exposed to these various civil engineering disciplines and give them a better idea in which field they want to specialize later on.

This year, AMH accepted a total of ten (10) young engineers as interns. Unlike in previous years, this year's interns are all graduates of the University of the Philippines, Diliman. The 2017 Batch of Civil Engineering interns are:

- 1. Aloysius Kristoffer Alipio, cum laude
- 2. Sabrina Luz Buensuceso, magna cum laude
- 3. Lodette Cunanan
- 4. Andrei Rafael Dita, cum laude
- 5. Angela Kariza Ines, cum laude
- 6. Patrick Nistal
- 7. Isabella Torres
- 8. Hiroshi Ueki, 9th place CE Board Exam
- 9. Ronald Valdez, cum laude
- 10. Laurice Angeli Villaflor, cum laude

"I thought that being exposed in the other fields would help me gain a more holistic picture of civil engineering", Sabrina Luz said. AMH being an academe-linked company prides its mentorship program. A number of AMH partners are faculty members from the Institute of Civil Engineering of UP Diliman. One of Lodette's expectations before entering the company is to acquire practical knowledge from great mentors.

Aside from the technical work, they are able to develop their interpersonal skills and their sense of professionalism. These are the things that aren't taught in school but are valuable in real life. Patrick said: "My communication skills have improved through coordination with clients and fellow engineers. On my personal finance, I developed a mindset of saving and investing my salary." On time management, Hiro said that he "used to put off working on things that are not yet due," but here he learned to "just finish work ahead of time and not stress about the deadlines."

What made the AMH experience more remarkable is the "family culture" that is established in the workplace. The weekly Brown Bag sessions, monthly Common Merienda, Company Outing, and Sportsfest provided an opportunity for the interns to interact with the other employees, establish good working relationships, and imbibe the core values and ideas promoted by the company.

18TH ANNIVERSARY: AMH IN FULL BLOOM

by Laurice Angeli Villaflor



AMH hosted an outreach activity and an annual dinner in celebration of AMH's 18th year.

As a way of showing gratitude for the success and triumphs of the company, an outreach activity, in partnership with *Ligaya ng Panginoon*, was held in Floridablanca, Pampanga with the Aeta community last August 12, 2017. The engineers prepared games and activities which included a dance presentation, skit, coloring sessions, and games for the kids. The half-day event was capped off with the serving of lunch.



The company returned home with genuine smiles of gratitude and appreciation from the people of the Aeta community.

To officially celebrate this year's anniversary, a simple gathering was held last August 31 with the theme: AMH in Full Bloom. The event was adorned with various kinds of flowers as the employees arrived in floral attire. The highlights of the evening were the new hires' presentation, employee loyalty recognition, and exciting prizes for the raffle. Awards were also given to the best dressed employees of the night. The 18th year signifies the coming of age of AMH as it continues to thrive and blossom into one of the recognized engineering consultancy firms here in the Philippines.

IN PURSUIT OF GRADUATE STUDIES

by Anne Jeanette De La Rosa

Balancing one's career with the demands of the academe will always prove challenging, but with determination and perseverance, one can do it.

- Engr. Meade Belle Apelo, MSCE (Geotech)

Since people are the most important assets of the company, AMH encourages its employees to pursue further studies in engineering and other related fields. One of the privileges of an AMH Engineer is the Employee Education Assistance Program (EEAP) where the company subsidizes the engineer's tuition in graduate school.

Currently, there are twenty-eight (28) out of eighty (80) engineers who are pursuing further studies in UP ICE and UP School of Urban and Regional Planning (SURP) in the University of the Philippines, Diliman. A number of the more senior engineers are already finishing their theses as a partial fulfillment of their master's degree. In the past two years, Engineers John Erickson delos Santos, Roda Perez, and Meade Belle Apelo finished their Masters in Geotechnical Engineering.

Engr. Roda noted that AMH played a big role in her decision to pursue further studies in her chosen field. Even if she is assigned in the Structural PBG, she thought that it would be good to learn more on the Geotechnical aspect of the foundation design. According to Engr. Roda, her previous projects in AMH made her fascinated with the soil-structure interaction.





Engr. Erickson said that AMH also provides student-employees some flexibility in their work schedules. One of the challenges he experienced was balancing his project work and study load. At some days, he had to sacrifice his class for a meeting or site visit. According to him, it was difficult attending his classes after a full day at work, however, it was all worth it. Now, he is being given special projects that need his expertise in geotechnical engineering.



SGS PHILIPPINES, inc. ENGINEERS CONSULTANTS