JURUTERA

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LEGACY FROM VISION TO REALITY: ENGINEERS SHAPING SUCCESSFUL PROJECTS

Orchestrating Success in Engineering

SEPTEMBER 2025

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Joseph How
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CHLORIDE RESISTANCE IN CONCRETE: A LONG-TERM FIELD STUDY IN A MARINE STRUCTURE

Introduction

Chloride ingress is a leading cause of reinforcement corrosion in concrete structures exposed to aggressive environments, including marine and coastal conditions (ACI 222R) and de-icing salts. This study evaluates the long-term chloride resistance of Xypex-treated concrete panels installed in 1995 at the Lascelles Wharf, Port of Geelong, Australia.

These panels have been subjected to a highly aggressive marine environment—positioned in the splash zone—and exposed to bulk chemicals and fertilizers from port off-loading operations. Chloride penetration analyses conducted in 2014 (CHEM-142) and 2021 (CHEM-155) provide a comparative assessment of Xypex crystalline technology's effectiveness in preventing chloride-induced deterioration.

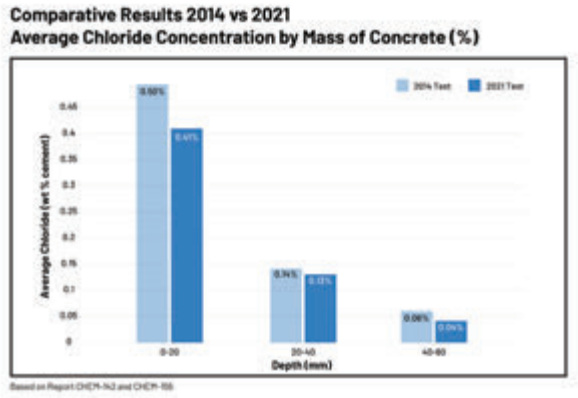
Experimental Procedure

The chloride penetration assessment was conducted using the following approach:

- **Core Sampling:** Chloride profiles were generated from core samples extracted from Xypex-treated concrete slabs.
- **Acid-Soluble Chloride Analysis:** Chloride content was measured at various depth intervals to assess ingress patterns.
- **Diffusion Coefficient Calculation:** The effective diffusion coefficient was determined from the chloride concentration gradients.
- **Threshold Benchmarking:** Chloride concentrations at reinforcement depth were compared to the 0.4% threshold to assess the risk of corrosion initiation.

Results and Discussion: 2014 vs. 2021

The chloride diffusion profiles indicate that chloride concentrations at reinforcement depth remained well below the corrosion threshold in both 2014 and 2021. The calculated apparent diffusion coefficient showed remarkable decrease, signifying that Xypex-treated concrete improves its suppression of chloride ingress over time, with no evident degradation in protection performance.



Conclusion

The 2014 vs. 2021 chloride ingress comparison demonstrates that Xypex-treated concrete improves its long-term resistance to chloride penetration, significantly reducing the risk of reinforcement corrosion over time. The decrease of the diffusion coefficient over time suggests that Xypex crystalline technology provides a permanent and self-sustaining protective effect, distinguishing it from conventional treatments, barriers and coatings that degrade with age.

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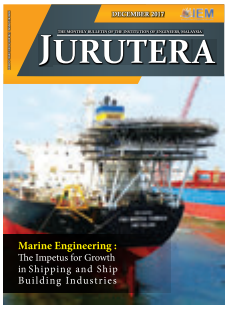

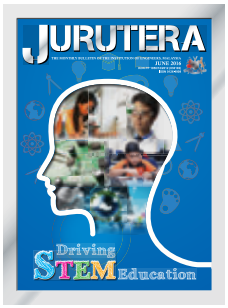

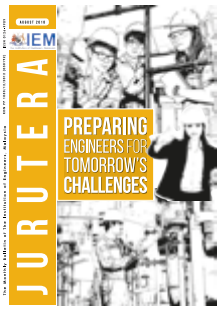

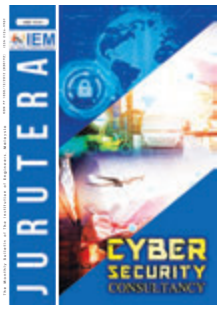

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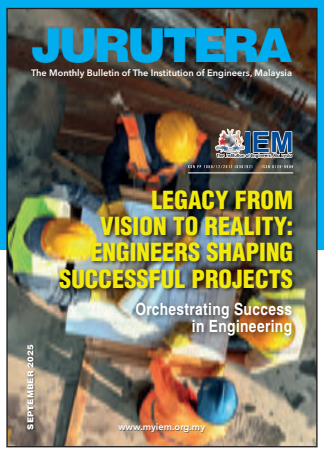

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Website: www.dimensionpublishing.com

Chairman
Robert Mebruer

CEO/Publisher
Shirley Tham
shirley@dimensionpublishing.com

Head of Marketing & Business Development
Joseph How
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Production Editor
Tan Bee Hong
bee@dimensionpublishing.com

Contributing Writers
Putri Zanina
putri@dimensionpublishing.com
Hanna Sheikh Mokhtar
hanna@dimensionpublishing.com

Senior Graphic Designer
Sofia Hanis Mohd Uzir
sofia@dimensionpublishing.com

Graphic Designer
Nicole Theng
nicole@dimensionpublishing.com

Advertising Consultants
Tham Choon Kit
ckit@dimensionpublishing.com

Accounts Cum Admin Executive
Yong Yen Yin
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Tel: +(603) 7890 0130
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COVER *Note*

by Ir. Dr. Harris Abd Rahman Sabri
Chairman, Project Management Technical Division (PMTD)

Successful Project Management

For the September 2025 edition of *JURUTERA*, we will showcase an exclusive interview with Ir. Sharifah Azlina Raja Kamal Pasmah, Chief Executive Officer (CEO) of HSS Engineering Sdn. Bhd. who share with us her invaluable experiences and insights on how to navigate the relentless complexities of large-scale infrastructure projects and demonstrates a proven blueprint for sustainable urban development.

We believe that by embracing a project-centric mindset, we will not only enhance our professional capabilities but will also contribute significantly to the nation's development and prosperity. It is through continuous learning, collaboration, and a relentless pursuit of excellence that we can truly lead the charge.

I would like to extend my sincere gratitude to the *JURUTERA* editorial team for their exceptional work in curating this insightful content. I invite you to read on, engage with the ideas presented, and be inspired to take your project management skills to the next level. ■

EDITOR'S *Note*

by Ir. Ts. Wan Rizaluddin Abdullah Wan Ali
Principal Bulletin Editor

Orchestrating Success in Engineering

In the ever-evolving world of engineering, project management is the silent conductor behind every successful endeavour. Whether it's building offshore platforms, upgrading transportation infrastructure, or delivering digital transformation initiatives, the principles remain timeless — clarity of vision, disciplined execution, and adaptive leadership.

Today's engineering projects face increasing complexity: Shorter timelines, tighter budgets, more demanding stakeholders, and rapid technological shifts. The role of the project manager has therefore expanded beyond scheduling and cost control. It now demands strategic thinking, risk anticipation, stakeholder diplomacy and, above all, the ability to lead diverse teams toward a shared objective.

In this edition of *JURUTERA*, we explore the art and science of project management in engineering. Our contributors share lessons learnt in the field, best practices for integrating technology into workflows, and insights on how to foster resilience when plans inevitably meet reality.

Ultimately, great project management is about more than just delivering on time and within budget — it's also about delivering value, leaving a positive legacy, and inspiring confidence in the engineering profession.

May these pages equip you with new ideas, sharpened tools, and renewed motivation to lead your next project to success. ■

From Vision to Reality: Engineers Shaping Successful Project

Interviewee:
Ir. Sharifah Azlina Raja Kamal Pasmah
Chief Executive Officer,
HSS Engineering Sdn. Bhd.

Engineering is not only about technical expertise but also about vision, leadership, and the ability to transform ambitious ideas into tangible outcomes. Few exemplify this better than Ir. Sharifah Azlina Raja Kamal Pasmah, CEO of HSS Engineering Sdn. Bhd., which has been at the forefront of delivering Malaysia's most transformative infrastructure projects.

From railways and highways to airports and water systems, HSS has played a pivotal role in bridging master plans with practical implementation, ensuring projects are delivered on time, within budget, and to the highest standards. In this exclusive interview, Ir. Sharifah shares her insights on project management, leadership, innovation, and sustainability — while highlighting the importance of nurturing the next generation of engineers to carry forward the nation's infrastructure legacy.

Legacy & Vision

Q *HSS Engineering Sdn. Bhd. played a vital role in nation-building projects such as railways, highways, and water infrastructure works. From a project management perspective, how has HSS contributed to turning these ambitious visions into reality and what do you see as its enduring legacy?*

HSS Engineering Sdn. Bhd. has consistently acted as a catalyst and integrator in Malaysia's nation-building journey, bridging visionary masterplans with practical implementation. From the formative development of federal roads upgrading projects to today's mega railways, highways, and water projects, our role has been to provide the project management leadership which ensures ambitious concepts translate into deliverable on-time, on-budget and on-scope outcomes.

From a project management perspective, the contributions included:

- Strategic Planning & Coordination. Aligning government agencies, financiers, and technical consultants under a unified roadmap.
- Risk & Stakeholder Management. Anticipating challenges in land acquisition, financing, and regulatory approvals, while balancing the needs of multiple stakeholders.
- Technical Integration. Overseeing multi-disciplinary engineering collaboration across civil & structure, geotechnical, MEP, BIM and environmental & socio aspects, ensuring seamless coordination.
- Adoption of Global Best Practices. Introducing international standards in project governance, contract administration, and digital tools like Building Information Modelling (BIM).
- Capacity Building. Mentoring and upskilling local engineers to elevate Malaysia's project delivery capabilities.

Ir. Sharifah Azlina sharing a moment with YB Deputy Minister of Works and the CEO of CIDB at ACEM's 62nd Anniversary Dinner on 23 August 2025

The enduring legacy of HSS can be seen in three dimensions.

1. Physical Infrastructure. World-class railways, highways, airports and ports as well as water treatment plants which have shaped the country's economic competitiveness.
2. Institutional Strengthening. Embedding strong project management and governance frameworks into the nation's infrastructure delivery model.
3. Human Capital Development. Cultivating a generation of engineers and project managers with the relevant expertise to drive future projects independently.

In short, HSS's role has been to transform vision into execution, and our legacy lies in both the physical landmarks across the country and the institutional and human capabilities that we leave behind to sustain national growth.

Q *From KLIA, the Pan Borneo (Sabah) Highway, privatised highways such as DUKE, SUKE, railways and transit such as ECRL, MRT1, 2 & 3, to the Baghdad Metro, HSS has been entrusted with some of the most transformative projects locally and internationally. In your view, how do such mega projects reflect the role of project management in shaping national and global legacies?*

Mega projects such as the ones mentioned here are not just engineering feats; they are also symbols of national ambition and global connectivity. All of them share the need for robust project management, which serves as the invisible hand aligning vision, resources, stakeholders and technical/financial executions.

Exchanging gifts with the CEO of PNB Merdeka Ventures during ACEM's visit to KL 118 Tower

For HSS, project management is not just about timelines and budgets but also about creating frameworks where diverse engineering disciplines, contractors and agencies work seamlessly together to deliver infrastructure that will last for generations. These projects demonstrate how project management shapes legacies by turning visionary blueprints into functional assets that redefine mobility, stimulate economies and uplift social communities both locally and abroad.

Leadership & Strategic Decisions

Q *As the CEO of HSS Engineering Sdn. Bhd., how do you balance long-term strategic vision with the day-to-day project management realities of delivering large-scale and complex developments?*

The act of balancing requires both clarity of purpose and disciplined execution. I have a strategic vision to position HSS as a trusted partner in delivering nation-building and transformative infrastructure.

Strong emphasis is placed on governance, digital innovation and talent development so that every project contributes to not only immediate success but also to the company's long-term growth trajectory.

On the ground, I rely on empowered project management teams who apply rigorous planning, risk management and stakeholder coordination to navigate the complexities of large-scale projects. My role is to ensure alignment between the Board and top management's strategic ambitions and the challenges faced by our engineers and project managers. This approach is fundamental to delivering today's projects while steadily building the institutional strength and expertise to sustain our future.

Q *Looking back on your career so far, can you share a defining project management decision that significantly influenced the outcome and legacy of major projects?*

HSS was involved in the masterplan, detailed design and construction supervision of the Kuala Lumpur International Airport (KLIA) in the 90s. That project was never just about building a transport hub; it was about shaping a symbol of Malaysia's progress and ambition, with a hard deadline tied to the 1998 Commonwealth Games. The scale was massive with high expectations and an unforgiving 5-year timeline.

As such, project management decisions were not just technical, but also defining. For HSS, one such decision stood out: The choice to embrace a fully integrated, multidisciplinary project management approach. Instead of letting each discipline operate in silos, HSS created a centralised framework where every specialist worked under one coordinated umbrella in a Project Office established for this purpose. This bold step demanded new tools such the early adoption of computer-aided design and continuous collaboration between designers and contractors.

The decision and approach created a ripple effect, setting new benchmarks for collaboration and integrated project management which continued to influence Malaysia's mega-projects today.

Years later, in 2012, HSS made another defining move, this time in digital space. Long before it became the industry norm in Malaysia, HSS had committed to adopting Building Information Modelling (BIM) in all its projects and established a licenced practice in BIM services.

Appearing on Selamat Pagi Malaysia on 18 August 2025, representing the Board of Engineers Malaysia to speak on "Challenges Faced by Women Engineers"

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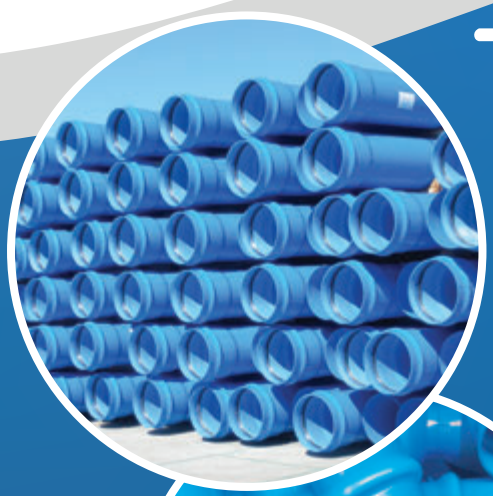

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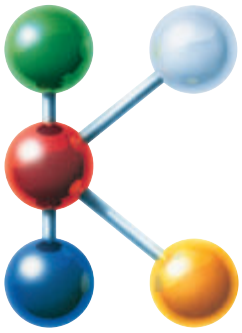

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For many at the time, BIM seemed daunting – costly software, steep learning curves and the need to rewire traditional workflows. But HSS recognised it to be a strategic shift towards smarter, more resilient project delivery, including value beyond construction with BIM data extended into asset management, supporting long-term operations and maintenance.

The decision positioned HSS as a digital pioneer. Just as KLIA had proven Malaysia's capacity for world-class infrastructure, BIM adoption proved that Malaysian consultants could lead the way in digital engineering.

Women in Project Management Leadership

Q *As one of the few female CEOs in the engineering consultancy sector, what unique perspectives do you bring to project leadership and the management of mega infrastructure projects?*

I believe the unique perspective I bring is the emphasis on collaboration, inclusivity and long-term value creation. Mega infrastructure projects are not only about engineering excellence but are also about aligning diverse stakeholders' needs, balancing community impact with commercial viability and ensuring sustainability for future generations.

I find that a leadership style rooted in empathy, strong communication and consensus-building helps unlock the best from multi-disciplinary teams, while still driving accountability and performance. At the same time, I am deeply committed to advancing diversity within the engineering profession as I believe diverse perspectives strengthen decision-making and lead to more resilient outcomes.

Always in my focus is ensuring HSS not only delivers world-class projects but also leaves behind a legacy of inclusive leadership and sustainability.

Q *What advice would you give to young female engineers in Malaysia on developing project management and leadership skills to succeed in a male-dominated industry?*

My advice to young female engineers is to firstly build a strong technical foundation as credibility in this industry comes from mastering your craft. Actively seek opportunities to lead, whether in small team settings or larger project environments, because leadership is a skill that is developed through practice and resilience.

Secondly, focus on communication and stakeholder management, as project management is as much about people as it is about engineering technicalities. Being able to align diverse perspectives and to keep teams motivated is what sets great leaders apart.

Finally, never let the perception of a male-dominated industry limit your ambition. Confidence, continuous learning and mentorship are powerful enablers. Surround yourself with mentors and allies, stay curious about new technologies and practices and remember that your unique perspective and voice add real value to the profession.

Challenges & Resilience

Q *Mega projects often have unexpected challenges. Can you highlight a situation where HSS Engineering Sdn. Bhd's project management approach helped overcome major challenges through innovation, collaboration, or risk mitigation? What lessons were drawn from that experience?*

Mega projects are, by their very nature, complex and we often encounter unforeseen challenges. One example was during the LRT Ampang Line Extension project, where extensive underground works in a dense urban environment posed risks of disruption to utilities, traffic, and surrounding communities.

Presenting a paper on "Malaysian Engineers' Mobility in International Markets" at BEM's National Engineering Convention 2025, in her capacity as BEM National Monitoring Committee member and CEO of HSS Engineering Sdn. Bhd.

Serving as ACEM's Honorary Secretary at its Council Meeting

HSS adopted an integrated project management approach, bringing together sub-contractors, utility providers, and government agencies into a collaborative platform. By leveraging digital tools such as BIM for digital twinning of stations and real-time monitoring dashboards, we were able to anticipate conflicts, re-sequence works and make faster, data-driven decisions. The outcome resulted in mitigated delays and cost escalations, as well as minimised disruption to the public — a key success factor for projects of such scale.

The key lesson we drew from this experience was that innovation and collaboration must go hand-in-hand with rigorous risk management. With the right governance, technology, and stakeholder alignment, even the most complex challenges can be turned into opportunities for stronger delivery and trust-building with clients and communities.

In the Baghdad Metro project, the challenges were of a very different nature. Beyond technical complexity, we faced issues such as regulatory ambiguity, financing hurdles, and the coordination of multiple international and local stakeholders in a highly dynamic environment. HSS applied a risk-mitigation-driven project management approach, setting up structured governance frameworks that clarified roles, responsibilities and decision-making processes across project proponents.

In all our projects, we adopt an incremental milestone strategy, breaking down the project into clear, certifiable stages. This allows progress to continue despite external constraints, while giving confidence to both the client and financial institutions to move forward.

Innovation, Sustainability & the Future

Q *With the growing demands of climate change, digitalisation, and sustainability, how has HSS embedded innovation and project management best practices to ensure sustainable and high-quality project delivery?*

At HSS, we see climate change, digitalisation and sustainability not as external pressures, but as core drivers of how we deliver projects. We embed innovation by adopting digital tools such as BIM, digital twins, and AI drone-driven project monitoring, which enhance efficiency, transparency, and risk management. At the same time, we integrate sustainability frameworks from the outset prioritising renewable energy, low-carbon materials and green certification standards in design and delivery.

Q *How can Malaysia's next generation of engineers, especially the young and aspiring who are building project management skills, play a crucial role in shaping the future of our nation's infrastructure and its legacy?*

Our next generation of engineers will be custodians of our nation's infrastructure legacy. Beyond technical expertise, they must embrace project management skills, digital innovation, and sustainability mindsets to ensure future developments are not only functional but are also resilient and future-proof.

Young engineers bring with them fresh perspectives, adaptability and a digital-first approach, qualities that are vital as we navigate challenges such as climate change, urbanisation and the shift towards smart and green infrastructure.

By combining technical excellence with leadership, collaboration and a strong sense of purpose, they can play a decisive role in shaping projects which uplift communities, strengthen competitiveness and define Malaysia's standing on the global front. ■

Interviewee's Profle

Ir. Sharifah Azlina Raja Kamal Pasmah is the Executive Director of HSS Engineers Bhd. and CEO of HSS Integrated and BIM Global Ventures. With over 35 years' experience in engineering, she has led and managed major transportation and iconic infrastructure projects locally and internationally. A board member of BEM (2022–2023), she now serves on its National Monitoring Committee and chairs the ESG Working Group. She is also a council member of The Institution of Engineers, Malaysia (IEM) and The Malaysia Rail Industry Corporation (MARIC) and Hon. Secretary of ACEM. An active industry leader, she champions digitalisation, innovation and women empowerment in the engineering fraternity.

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Inside Back Cover (IBC)	6,750	6,250	5,950	5,650	5,350
Page 1	6,650	6,150	5,850	5,550	5,250
Facing Inside Back Cover (FIBC)	6,150	5,850	5,550	5,250	4,950
Facing Cover Note (FCN)	5,850	5,300	5,100	4,900	4,700
Facing Contents Page (FCP)	5,700	5,150	4,950	4,750	4,550
Centre Spread	11,200	9,500	9,000	8,500	8,000
ROP Full Page	4,900	4,500	4,300	4,100	3,900
ROP Half Page	2,900	2,650	2,550	2,450	2,350
ROP 1/3 Column	2,200	2,000	1,900	1,850	1,800
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Adoption of Nature-Based Solutions & Nature-Based Infrastructure in Construction Project

by:

Ms. Thaarshini Paramasivan

Marine policy researcher at Centre of Coastal Marine Environment, Maritime Institute of Malaysia.

Mr. Aiman Hisyam Azmi

Marine policy researcher for Centre of Coastal Marine and Environment, Maritime Institute of Malaysia.

Ir. Ts. EUR ING. Assoc. Prof. Dr. Syuhaida Ismail

Vice Chair of PMTD and Director of Research at Maritime Institute of Malaysia.

Throughout history, human evolution has been driven by the pursuit of solutions to life's multi-faceted challenges, ranging from environmental concerns to social and economic issues. The solutions are identified, tested, and embraced to include natural elements or more like nature-based solutions, and are often adopted in natural systems to raise their economic potential.

For example, in the 14th century, Aztecs created floating agricultural islands, known as chinampas (Giannetto, 2020. The Editors of Encyclopaedia Britannica, 2017). Chinampas were constructed using reeds and soil to optimise water management and to enhance food security (Ebel, 2020).

In the Philippines, rice terraces were started 200 years ago (Acabado *et al.,* 2020). This was done by mimicking the ingenious landscape engineering to harness the natural water flow for sustainable irrigation in padi fields.

These show that solutions which harness the natural environment can be done systematically to enhance the economy and address food security.

This stems from the idea of defining solutions derived from nature, known as Nature-based Solutions (NbS), defined as actions to protect, sustainably manage, and restore natural or modified ecosystems in ways that address societal challenges effectively and adaptively, while simultaneously providing benefits for human well-being and biodiversity.

First defined by the International Union for Conservation of Nature (IUCN) in 2009, NbS serves as an umbrella concept that encompasses ecosystem restoration, issue-specific ecosystem management, infrastructure, and the protection of ecosystems guided by ecosystem-based approaches (Cohen-Shacham *et al.,* 2016). Alongside these actions and measures is Nature-based Infrastructure (NbI), defined as one of the approaches that supports the concept of NbS.

NbI, sometimes known as green infrastructure, natural infrastructure, or ecological infrastructure, is a type of NbS that involves the protection, restoration, improved management, or creation of natural and semi-natural ecosystems to provide services relevant to the functioning of infrastructure (UNEP, 2023).

As for engineering and project management perspective, NbS and NbI offer innovative frameworks which can be integrated into the planning, design, implementation, and monitoring phases of infrastructure projects. Engineers and project managers can apply NbS as part of sustainable design criteria and life-cycle assessment strategies to ensure that project deliverables align with environmental sustainability, resilience, and long-term cost efficiency.

Revival process at the site of artificial islands known as Chinampas created by the Aztecs for agricultural purposes due to Covid-19 pandemic. Credit: Ronaldo Schemidt/AFP

NbS and NbI concepts come with a set of guiding principles. They are not intended to serve as substitutes for reclamation or restoration efforts following project developments which impact the natural environment. Instead, the concepts are considered viable when their principles are aligned with the objectives of the project being implemented. The need for the adoption of NbS and NbI came into consideration in recent years due to many countries facing unprecedented challenges in meeting development needs due to rapid global population increase, high demands for resources, and uncertain climate change effects (UNEP, 2023).

According to the United Nations (2023), 2.2 billion people still lacked access to safely managed drinking water, while 3.5 billion people lacked safely managed sanitation services. In addition, despite efforts to achieve sustainable energy targets, the slow pace of progress means that around 60 million people are projected to still lack access to electricity by 2030 (United Nations, 2023). These challenges are also reflected at the urban level, where half the global population resides. It is projected that over 2 billion people will be living in slums or slum-like conditions in cities by 2030 (United Nations, 2023).

Rice Terraces of the Philippines. Credit: Patrick Venenoso

To support the rapidly growing global population and its increasing needs and demands, it is crucial to leverage the infrastructure and construction sectors by adopting NbS and NbI to help mitigate the negative impacts. Infrastructure is vital for society and its economic development by providing essential services, such as electricity, water, sanitation, healthcare, transportation, and many more.

Poor infrastructure can lead to unsustainable, high-carbon development, increased climate vulnerability, and further ecosystem fragmentation, degradation, and loss. This highlights the need for infrastructure investment inclined towards NbS and NbI for sustainable factors as, to date, infrastructure investments are predominantly focused on hard engineering solutions which undermine the natural elements of the environment.

In engineering practice, the integration of NbS and NbI introduces a paradigm shift in how civil, environmental, and urban engineers conceive sustainable and resilient infrastructures. For project managers, these approaches inform risk management, stakeholder engagement, and value engineering to balance ecological, social, and economic returns over the project life-cycle (Raymond *et al.,* 2017). NbS and NbI can be applied in urban development to coastal area development.

Bioswales, vegetated shallow channels that manages stormwater runoff. Credit: Milwaukee Metropolitan Sewerage District

For urban development, the integration of NbS and NbI plays a crucial role in mitigating urban flooding by reducing flood damage to infrastructure, alleviating pressure on built flood management systems, and enhancing overall resilience. Green roofs, green walls, and urban green spaces, such as bioswales, wetlands, and parks effectively absorb water, promote groundwater infiltration, and minimise surface water accumulation, thus contributing to sustainable urban water management (Addo-Bankas *et al.,* 2024).

Coastal integration of NbS and NbI can reduce coastal erosion which can pose a risk to infrastructure systems (Mohamed *et al.,* 2021). Protection, restoration, and management of coral reefs, beaches and dunes, seagrass, and mangroves, can be effective in reducing wave heights and energy, and minimising the impact of coastal hazards.

In order to integrate the adoption of NbS and NbI in the infrastructure and construction industry effectively, it is recommended to develop a common NbS framework together with policy and institution arrangement. This is because policy and regulatory reforms are crucial for the implementation and promotion of NbS to various stakeholders (Annammala *et al.,* 2024). Through a project management lens, such integration calls for structured stakeholder management, integration of environmental risk assessments into project scopes, and the inclusion of NbS metrics in monitoring and evaluation (M&E) frameworks.

Moreover, there is a growing need to build capacity, enhance scientific knowledge, and strengthen technical expertise to effectively integrate NbS and NbI concepts within the infrastructure and construction industries. Building capacity plays a vital role in closing knowledge gaps, increasing awareness, and enhancing an understanding of how to scale up NbS using evidence and measurable indicators of success (Tomaskinova *et al.,* 2021).

Lastly, it is also significant to promote financing, investment, and innovative funding opportunities to scale up NbS. Public funding plays a crucial role, as the public sector is able to allocate these resources towards climate action and achieving the Sustainable Development Goals (SDGs). As part of economic recovery efforts, mechanisms like tax breaks, investment incentives, and stimulus programmes can be introduced to promote emerging growth areas and sectors (Schilirò, 2020).

Incorporating these approaches into engineering project delivery models, including feasibility studies, design reviews, risk matrices, and cost-benefit analyses, ensures that NbS is not only considered but prioritised where feasible. All in all, working with nature for creditable solutions amplifies social and economic value while trying to address environmental solutions effectively. It also takes care of the need to integrate NbS and NbI in industries and other sectors, especially infrastructure and construction industries, and to deal with the growing demand of resources due to high globalisation. ■

Bosco Verticale (Vertical Forest) is a sustainable residential tower that integrates green infrastructure into urban architecture. Credit: Eterno Ivica

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Case Study on Project Management Approach for Underwater Pipeline Repair

by:

Ms. Nadia Azmi

Experienced pipeline integrity leader with over 15 years in upstream O&G, driving risk-based programmes and operational excellence.

Ir. Teo Eu Jin

15 years' experience in Oil & Gas, specialising in onshore/offshore construction, repair, innovation, and project management.

All projects are unique, temporary efforts within a timeframe that comprises the beginning and ending phases where the main objective is to generate value in terms of products, services, or results. Each project differs from standard routine operations in an organisation.

Usually, projects have an allocated team, budget, and schedule to accomplish the set expectation, allowing stakeholders to reap the benefit upon completion of the project. In simple language, project management uses specific knowledge, skills, tools, and techniques to deliver something of value to the stakeholders or target users and this can range from software development and engineering construction to social or charity work for the needy.

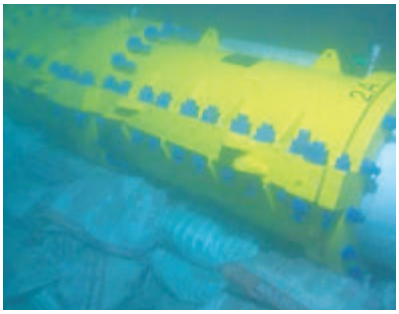
There are different approaches to managing projects, namely Predictive, Agile and Hybrid. The Predictive (Waterfall) approach uses traditional methodology by sequencing the workflow in well-defined phases of initiation, planning, execution, monitoring and closure, where the later phase is dependent on the completion of the earlier phase. There is also strong emphasis on upfront planning. The nature of the Predictive approach makes it suitable for projects with stable requirement (fixed target) and minimal changes.

For the Agile approach, the emphasis is on flexible planning which is subject to changes (moving target), based on emerging requirements and feedback. This approach uses both Iterative and/or Incremental project life-cycle; the former divides the project into smaller tasks to refine the scope, while the latter delivers the product progressively. Moreover, Agile highlights a self-organised team that collaborates closely with the stakeholders.

The Hybrid approach combines both Predictive and Agile approaches, leveraging on each other's strength. A Hybrid approach is tailored to balance structure and flexibility according to the needs of the project. The case study in this article will further elaborate on the Hybrid approach.

In all projects, it is crucial to understand the project goals based on stakeholders' expectations. Moreover, it is wise to produce an estimate in terms of Scope, Schedule, and Cost (e.g. Rough Order of Magnitude) to initiate discussions with the key stakeholders. This allows them to have a brief overview of the project and enables two-way communication. Indeed, this will enable the project team to collect useful feedback at the start of the project, minimising discrepancies in the stakeholders' expectations. Equally important is to ensure that all key stakeholders are identified to avoid hiccups during the project.

For this case study, the key stakeholders comprised multiple parties, ranging from government agencies such as the Department of Safety & Health, the Department of Environment, the Marine Department, members of the public, and most definitely the Asset Owner and Asset Operator who required a dented pipeline to be rectified safely.



View A

View B

View C

Figure 1: Actual epoxy sleeve repair system used in this case study.
Note: The clamp shown is one of the first Modular Epoxy Sleeve Clamps which come in multiple sections designed to cater to pipeline contours. The entire process, from designing, fabrication, and installation in local waters was done by Malaysians.
(Photo courtesy of Merit Composite Sdn. Bhd., one of the solution providers of the Epoxy Sleeve Repair System)

Case Study: Pipeline Repair via Various Project Management Approaches

Malaysia is rich in natural resources, with the Oil & Gas industry continuing to be a significant contributor to the economy. One of the critical lifelines in this industry is the underwater pipeline for transporting crude oil and natural gas to onshore facilities for processing purposes. Despite having a proper inspection programme in place, there may be unprecedented events where damage can occur due to external factors, requiring the pipeline owner and operator to respond appropriately.

Pipeline damage is undesirable in the Oil & Gas industry but sometimes, it can and does happen. Most importantly, the response of the asset operator and asset owner in performing damage control and mitigating the consequences to the affected pipeline, impacted parties and areas, is crucial. If the response action is effective, there will be minimal or negligible concern over safety, health, and environment.

This case study showed an example of a dented pipeline which had experienced roundness and straightness issues due to ship anchor drag; the technical team assessed the damage and responded with proper engineering controls. The project objective was to understand the degree of damage and to mitigate the damaged area appropriately to prolong its service life.

This specific pipeline repair project was chartered and segregated into the following stages: Underwater Pipeline Inspection, Engineering Damage Analysis, Repair Option Selection, and Repair Preparation & Execution.

The team initiated each stage by first identifying the relevant stakeholders and then collaborating with them to plan each stage. This step is important for addressing the Triple Constraint in project management by ensuring the work scopes are properly defined, schedules established, and cost estimated. Since the nature of each stage is different, a suitable project management approach should be utilised at each individual stage to effectively meet the project objective.

1. **Data Collection**

(a) Underwater Pipeline Inspection

Hybrid Approach with Waterfall Major: Once feedback of pipeline damage was received, the pipeline owner had to take immediate action as part of due diligence and regulatory compliance (Project Introduction Trigger). The goal at this stage was to collect data and to evaluate the degree of damage so, an inspection air diving barge was chartered for this purpose. Additionally, the planning and scope of work, including the type of underwater inspection and techniques, were refined and fixed after a few iterative sessions. This was done prior to developing the Gantt Chart for predictive execution (Table 1), which defined the sequence and campaign duration with consensus from stakeholders. Moreover, interpersonal soft skills of the project team was essential at this stage to maintain the line of communication after the project kick-off meeting, ensuring the team had a clear picture and remained aligned.

(b) Engineering Damage Analysis

Pure Agile: Non-physical scope where the team engaged an engineering consultant to evaluate the damage via software modelling and analysis. The goal at this stage was to urgently understand the impact of the dent on the pipeline, but the outcome was still unclear and might be subjected to changes when more parameters were input to the software. Therefore, the consultant needed to regularly present to the stakeholders to acquire feedback and refine the analysis. This Agile approach consisted of a few iterations addressing the Procurement of Service, Engineering Study, and Report Review to determine an accurate outcome.

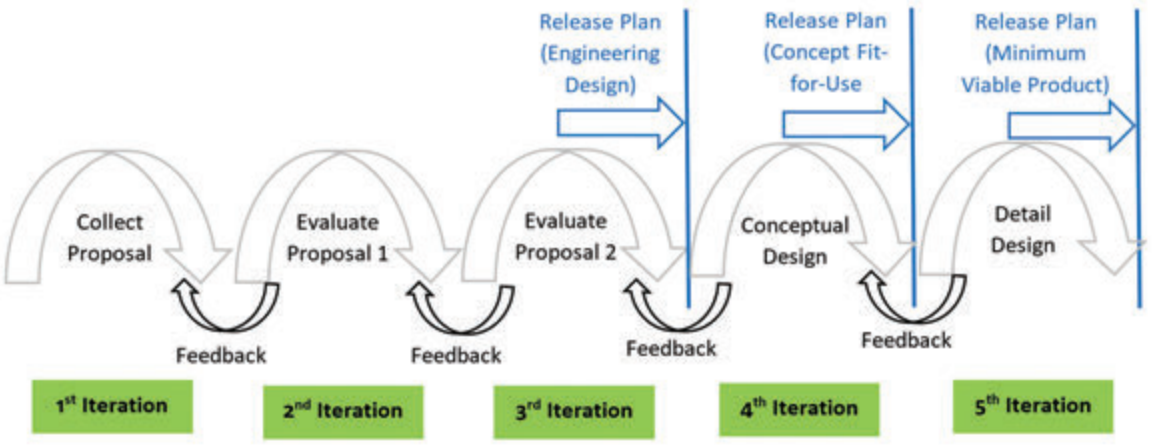
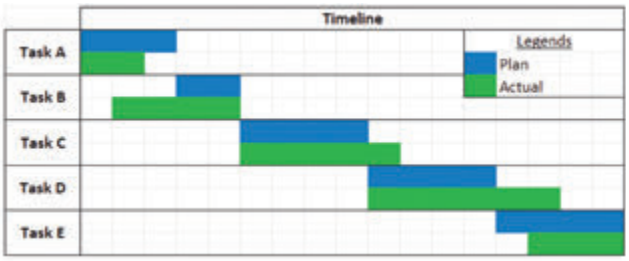
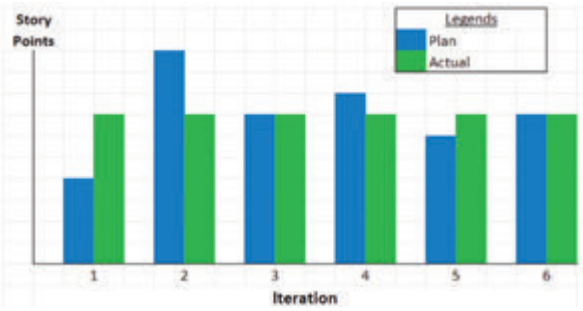


Figure 2: Sample graphical presentation of Agile Cycle during Repair Option Selection stage

Table 1: Comparison of Gantt Chart and Velocity Chart

Sample Gantt Chart to Measure Work Progress (Normally for Predictive Approach)	Sample Velocity Chart to Measure Story Point (Normally for Agile Approach)
	
Predictive methodology is commonly utilised on physical product, for example, fabrication of goods and construction work.	Agile methodology is typically preferrred on non-physical product as it is a measurement of effort such as planning and designing.

Remark: For the Agile approach, a Velocity Chart can be used to capture progress based on the job effort (story point) and time factor (iteration). This approach emphasises flexibility, collaboration, and adaptability, allowing team members to refine or improve the design after collecting feedback from stakeholders.

2. Repair Method

(c) Repair Option Selection

Upfront Selection and Planning – Pure Agile: This stage started with the collecting of mitigation proposals from various potential repair vendors. Basically, the scope of work comprised team conceptual studies of each proposal in terms of technical reliability, installation practicality, operational feasibility, mitigation effectiveness, and material cost, including the pros and cons. Once the best option was selected, the procurement process commenced, allowing the team to proceed with Engineering Design, including Finite Element Analysis to confirm the repair concept was fit-for-purpose.

The Engineering Design could be considered a form of progressive elaboration planning from Conceptual Design to Detail Design. Associated stakeholders were constantly engaged to obtain feedback, ensuring the outcome was desirable to all parties and could lead to the delivery of the Minimum Viable Product.

(d) Repair Preparation and Execution

Hybrid Approach with Waterfall Major: Once all front-end engineering work was completed in the earlier stages, the repair mitigation plan and work schedules were developed by defining the requirement and sequence the activities to capture the critical path. It was vital to adhere to the company procurement process and to conduct sufficient material control and monitoring, including performing the necessary testing to ensure the final repair system met end-user quality expectations with timely delivery (Table 2).

Table 2: Sample steps in Waterfall Major Methodology (Hybrid)

Initiate	Plan	Execute	Control / Monitor	Close-up
Project chartered and Stakeholder identified for this final stage. (Company Management, Repair Diving Barge, Repair Vendor, etc.)	Addressed the Underwater Pipeline Repair Scope, Schedule, and Cost aspects based on earlier work done and info. (Since this phase is non-physical, the Agile approach was used.)	Purchased repair material and engaging the barge. The Underwater Pipeline repair campaign is relatively high risk, and individual tasks need to be executed per the procedure (risk captured)	The Pipeline Owner assigned an in-house representative to validate and verify the work done by the contractors. Photographic evidence taken as part of task completion.	After all the required repair tasks were completed with satisfactory results, the documents were signed off by the customer, and lessons learnt were captured for future improvement.

During the underwater pipeline repair campaign, resource management, in terms of manpower, equipment and material, was another crucial skill, indirectly addressing the budget. All jobs had a certain degree of risk, and to minimise hiccups, the teams needed to be proactive in risk identification, analysis and response, adhering to the established project procedures. Since the project had stable requirements at this stage and timeline was certain, a Predictive Major approach was suited for better execution, control, and monitoring.

Conclusion

The project life-cycle is a framework that defines the phases a project goes through from beginning to end. It also provides a roadmap for managing projects, ensuring tasks are completed efficiently and effectively. Since scenarios may differ, it is crucial to have a tailor-made Project Management method to oversee the specific job, whether it is Predictive, Agile or Hybrid. Moreover, both technical and intellectual aspects, together with Servant Leadership, are pivotal to the success of the project, satisfying all stakeholders involved. ■

REFERENCE

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Kickstarting 2025: PMTD Retreat & Brainstorming Day Sets the Stage for a Stellar Year Ahead

by:

Ir. Ts. EUR ING. Assoc. Prof. Dr. Syuhaida Ismail

Ir. Ts. Nur Islam Nur Iskandar

The Project Management Technical Division (PMTD) of the Institution of Engineers, Malaysia (IEM) held its Retreat & Brainstorming Day on 8 February 2025 at Le Meridien Hotel, Kuala Lumpur. The inaugural event was a perfect platform for collaboration, strategy-setting, and revitalising PMTD commitment to excellence.

Despite the lingering echoes of the Chinese New Year celebrations, there was full attendance of all 11 committees appointed for the 2024/2025 term; this was a strong indication of the enthusiasm and dedication of PMTD members. The event was designed to not only outline the goals for the year ahead but also to strengthen the division's cohesion and to ensure everyone was aligned in their vision for the future.

The day began at 8:00 a.m. with a networking breakfast. Participants took advantage of the informal opportunity to connect and recharge. At 8:30 a.m., the stage was set and PMTD Chairman Ir. Ts. Dr. Harris Abd Rahman Sabri gave an introduction to PMTD. He welcomed the newly appointed committee members and guided them through the division's core values and aspirations.

Dynamic discussions during the PMTD Retreat & Brainstorming Day involving all the active committee members

The event quickly transitioned into more substantive discussions, with a session led by Assoc. Prof. EUR. ING. Ts. Ir. Dr. Syuhaida Ismail, the PMTD Deputy Chairman, who specifically highlighted the criteria for fulfilling the Presidential Award of Excellence (PAOE) Guidelines.

Being a critical segment for the division, this session also provided strategies to enhance PMTD's chances of securing more marks for the award, which the division had been proudly receiving since 2016. The importance of setting a clear direction and demonstrating continuous improvement was underscored, with the award seen as an emblem of the division's hard work and contributions.

Next, participants engaged in an energetic brainstorming session dedicated to planning exciting activities for the year. The discussions were dynamic, with committee members sharing ideas on initiatives to boost knowledge sharing, to strengthen the PMTD community, and to increase the impact of the division's work on the larger engineering and project management fraternity beyond the IEM.

PMTD committee members 2024/2025

Before breaking for lunch, the Project Management Conference (PROMAC 2025), the flagship of PMTD event, was discussed at length. Scheduled for 2 Oct. 2025, this would be IEM's highlight of the year. Plans for the conference were finalised, with the team excited about the robust lineup of speakers and sessions designed to showcase the latest advancements in project management. The day wrapped up at 2:00 p.m.

The PMTD Retreat & Brainstorming Day proved to be the perfect start to a year that promised both growth and innovation. With clear goals, an exciting calendar of events, and a solid commitment to excellence, PMTD is set to make 2025 a year to remember for the project management fraternity. ■

Presenting ideas and discussions for the year ahead

Congratulations

IEM Council and Management would like to extend our heartiest congratulations to

Ir. Chan Wah Cheong

on being conferred the Darjah Johan Negeri (D.J.N) by Tuan Yang Terutama Tun Dato's Seri Utama Haji Ramli Ngah Talib, Yang Di-Pertua Negeri Pulau Pinang on the occasion of his 84th birthday.

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BACKGROUND

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Strategic Capacity Building for Sustainable Energy Development

by:

Ir. Noor Iziddin Abdullah Haji Ghazali

As Malaysia strengthens its national commitment to sustainable development, the engineering profession must respond proactively to the growing demands of climate governance, energy transition, and inclusive infrastructure. Central to this response is the integration of Environmental, Social, and Governance (ESG) principles and the Sustainable Development Goals (SDGs) into professional practice and project delivery systems. In this context, the Project Management Technical Division (PMTD) of the Institution of Engineers, Malaysia (IEM) has launched five targeted knowledge platforms to equip engineers, project managers, and consultants with the capabilities required to lead sustainability transitions in Malaysia and ASEAN.

1. Project Management Tools & Techniques for SDG & ESG Projects

The first initiative, a half-day virtual course, focused on the practical application of project management tools within sustainability frameworks. Participants were introduced to logical frameworks, stakeholder engagement tools, and risk matrices tailored to ESG and SDG outcomes. The course emphasised digital enablement, performance indicators, and outcome-based monitoring. It highlighted how traditional project approaches must evolve to systematically address environmental and social parameters alongside cost, time, and quality.

Capacity Building for SDG & ESG

Sustainability Triangle

2. Consultant Competencies for SDG & ESG Projects

Delivered as a full-day training session, this programme examined the transformation of the consulting role in an ESG-driven landscape. It outlined the key competencies needed for consultants working on SDG-related projects, including policy literacy, stakeholder engagement, ethical leadership, and strategy formulation. The course underscored the importance of systems thinking and values-based consultancy. It redefined consultants as strategic partners capable of shaping both physical infrastructure and institutional direction.

3. Managing Project Capacity in the SDG & ESG Sector

The third session, conducted virtually over half a day, addressed the organisational dimensions of ESG-aligned project implementation. Participants explored governance models, capacity-building frameworks, and performance

management systems rooted in the Project Management Professional (PMP) methodology. Emphasis was placed on addressing systemic issues such as fragmented coordination and institutional inertia. The session advocated for repositioning project management offices as centres for sustainability innovation and policy integration.

4. Climate Change Project Finance in SDG & ESG Environment

This half-day module tackled the financial ecosystem of sustainability projects. It introduced engineers and project managers to climate finance mechanisms, including blended finance, ESG bonds, green sukuk, and public-private partnerships. Participants were guided on how to navigate national and international climate funds, including opportunities from multilateral agencies like the Green Climate Fund. Tools such as funding proposal templates, impact assessment matrices, and real-world project case studies were shared to strengthen participants' financial literacy and project bankability.

5. Project Consultant in Renewable Energy Sector: Between Skill & Competency

The final session, presented as a virtual talk, explored the competency gap in Malaysia's fast-developing renewable energy (RE) sector. Drawing from case studies under the Large Scale Solar, Battery Energy Storage Systems, Net Energy Metering, and New Enhanced Dispatch Arrangement programmes, the session explored the evolving requirements for RE consultants. The role now extends beyond engineering design to include regulatory navigation, environmental compliance, and stakeholder collaboration. This shift calls for consultants to function as value creators who can connect technology, policy, and societal needs.

EVOLVING ROLE OF RE PROJECT CONSULTANTS

Traditional Skills	New Competencies
Engineering Design	Regulatory Compliance
Technical Knowledge	Stakeholder Engagement
Site Supervision	Climate Finance Awareness
Construction Monitoring	Policy & Environmental literacy
Reporting	Strategic Value Creation

Role of Sustainability Project Consultant

Collective Impact & Strategic Direction

Together, these five interventions reflect PMTD's strong commitment to elevating engineering capacity in alignment with Malaysia's sustainability ambitions. They signal a shift from purely technical training to strategic capacity building that embeds ESG thinking in every aspect of engineering leadership and project governance. These programmes support Malaysia's efforts in achieving SDG 7 (Affordable and Clean Energy), SDG 13 (Climate Action), and SDG 17 (Partnerships for the Goals).

Conclusion

The path to sustainability is not merely about adopting new technologies but also about rethinking the entire engineering value chain, from planning and financing to execution and impact monitoring. As the ESG and SDG agendas continue to reshape infrastructure development and investment decisions, the engineering profession must rise to meet these challenges with upgraded competencies, ethical frameworks, and systems-level thinking.

PMTD's knowledge platforms represent more than technical courses; they serve as strategic interventions to prepare our engineers and consultants to lead the region's low-carbon, inclusive future. ■

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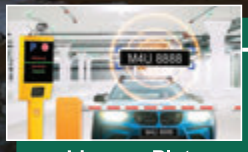

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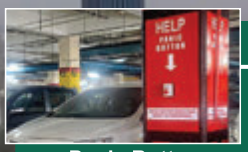

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Technical Visit to PLUS Traffic Monitoring Centre

by:

Ir. Noorfakhriah Yaakub

On 2 July 2025, the Highway & Transportation Engineering Technical Division (HTETD) organised a technical visit to the PLUS Traffic Monitoring Centre (TMC) in Persada PLUS, Subang. This provided a good opportunity to explore the operational backbone of Malaysia's longest expressway network, operated by PLUS Malaysia Berhad.

The delegates, led by HTETD Chairman Ir. Foo Kam Fai and Ir. Gunasagaran Kristnan, consisted of participants from civil engineering industry and institutions. Additionally, the HTETD invited officers from Bahagian Perancang Jalan, Kementerian Kerja Raya, to add value to the technical visit as well as to promote future collaborations between the two highway divisions.

As one of South-East Asia's leading highway operators, PLUS plays a crucial role in ensuring road safety, efficient traffic flow, and fast incident response across 1,130 kms of expressways. The TMC serves as the nerve centre for real-time traffic surveillance and coordination, utilising the state-of-the-art Intelligent Transport Systems (ITS).

Upon arrival, we were warmly welcomed and directed to a briefing room where a comprehensive briefing session was conducted by Mr. Suhairy A. Rahman, PLUS Head of Traffic Safety (TS). The briefing included PLUS background, the scope of its expressway services, and the strategic importance of the TMC as one of four core units under TS. PLUS highways serve over 1.9 million vehicles daily along its network; the numerous daily incidents are managed by TMC Supervisors and Agents in Persada PLUS. The presentation covered various operational elements, including real-time surveillance, vehicle detection systems, Digital Variable Message Sign (VMS) control, incident detection and crisis management, response coordination, PLUS Ronda services and stakeholder management.

In order to ensure the efficiency of its operations management, TMC is divided into five teams which monitor real-time incidents, provide assistance while coordinating emergency responses, and do follow-ups after the incidents. TMC Agents receive 1,200 to 2,000 calls daily, depending on the season. The number of calls and incident response times have been reduced with the introduction of PUTRI Virtual Assistant and the PLUS App which is designed for all types of users. The TMC also disseminates real-time traffic information through social media and radio platforms. Overall, it serves to ensure comfortable and safe journeys for users along PLUS highways.

Presenting a token of appreciation to PLUS TS Head, Mr. Suhairy A. Rahman
(Photo courtesy of PLUS TMC)

IEM delegates and the PLUS team at Persada PLUS Lobby
(Photo courtesy of PLUS TMC)

Screenshot of VMS Message to IEM delegates near Menora Tunnel
(Photo courtesy of PLUS TMC)

Briefing by the Head of PLUS TMC, Ms. Noor Ezwani Nor Kamal
(Photo courtesy of PLUS TMC)

Next, Ms. Noor Ezwani Nor Kamal, the Head of TMC, talked about the Penang Bridge Suicide Attempt Alert System (SAS) which adopts AI technology. The system is designed specifically for the Penang Bridge and it monitors the hotspots based on historical data, providing early detection and alerting the relevant authorities. The AI system uses machine learning algorithms to analyse live video feeds from cameras in real time. SAS has helped increase the survival rate of persons attempting suicide at Penang Bridge by 29% in 2024.

Among other initiatives is the Automatic Highway Asset Defect Detection (AHADD) system which uses dashboard cameras attached to patrolling vehicles to automatically detect hazardous objects along the highway such as discarded furniture and defects such as potholes. PLUS also strives to keep improving its services with planned initiatives and Prove of Concepts (PoC) such as implementation of CCTV AI at certain stretches.

The participants showed a keen interest in the PLUS operations and performance during the lively and enthusiastic Q&A session. Based on internet research, there was no official benchmarking of the PLUS TMC in Malaysia or within the South-East Asia region. However, it is said to be among the most technologically-advanced and critical in the region.

The highlight of the visit was a guided tour of the control room via Vista Gallery to see how traffic across the PLUS network was monitored and managed. The control room featured a large video wall displaying live feeds from hundreds of CCTV cameras located strategically along the expressways. PLUS personnel elaborated on the 24/7 monitoring operations and how these were used to manage congestion, alert users, and dispatch emergency assistance efficiently.

The technical visit to PLUS TMC concluded with a photo session at the Persada PLUS Lobby and an exchange of tokens of appreciation between PLUS and IEM. The visit proved to be both educational and inspiring, offering participants a deeper understanding of modern highway management and the sophisticated technologies that ensure the safety of millions of daily road users. The IEM HTETD extends its sincere thanks to PLUS for its hospitality and knowledge sharing. Such industry collaborations play a vital role in bridging the gap between academic learning and real-world applications. ■

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Journey of Collaboration and Knowledge Exchange

by:

Ir. Ts. EUR ING. Assoc. Prof. Dr. Syuhaida Ismail

Ts. Aina Assikin Hadi

The IEM Project Management Technical Division (PMTD) organised a comprehensive outreach programme in the Philippines on 12-15 September 2024. This initiative was aimed primarily at fostering professional networking, facilitating knowledge exchange, and advocating for Science, Technology, Engineering & Mathematics (STEM) education and careers. The programme, which included a variety of public and private engagements, left a lasting positive impact on both the PMTD committee members and the host organisations.

Courtesy Visits & Professional Networking

The programme started with a courtesy visit to the Partnerships in Environmental Management for the Seas of East Asia (PEMSEA), a regional body dedicated to sustainable development in East Asian seas. Led by PEMSEA Executive Director Aimee T. Gonzales, the meeting focused on strengthening bilateral relationships and exploring collaborative opportunities in project management and engineering for sustainable regional development.

Representing PMTD was the Deputy Chair, Assoc. Prof. Dr. Syuhaida Ismail, who delivered a presentation on Project Management in the Maritime & Ocean Industry from the Malaysian perspective. These exchanges were a valuable platform for participants to share insights on professional standards, ethical practices, and the innovations driving the field of project management globally.

CSR Activities: Empowering Communities

A key component of the outreach programme was its Corporate Social Responsibility (CSR) activities, aimed at empowering local communities in Manila. PMTD committee members visited Moskeng Ginto (Golden Mosque), a prominent landmark in the Quiapo district, to engage with the local Muslim community. The team focused on improving the mosque's community centre, working together with the locals to clean and enhance the mini-library to foster a better environment for education. As a gesture of support, monetary contributions were also presented to the mosque imam, Haji Muhammad Erzad Malli.

Technical Exchanges: Advancing Best Practices

The programme's technical exchanges were a pivotal highlight. During the session with the Philippine Technological Council Women Engineers Network (PTC-WEN), discussions were held on integrating gender diversity within the engineering profession, addressing workplace challenges, and adopting best practices to improve project outcomes.

Ts. Ir. Dr. Harris Abd. Rahman Sabri handing over a memento and monetary contributions to Haji Muhammad Erzad Malli, the imam of Mosken Ginto

Dr. Azhar Arif, the Past Chair of PMTD, delivered a presentation titled Exploring Project Management Opportunities with IEM, promoting PMTD's annual activities and the upcoming PROMAC 2025 conference. This engagement highlighted the importance of industry-academia collaboration for continuous improvement in engineering solutions.

The PMTD also held a strategic meeting with the Bureau of Agricultural & Fisheries Engineering (BAFE). Discussions revolved around advancements in agricultural and fisheries engineering and collaborative approaches

to enhancing productivity and sustainability. Dr. Abd. Rahman Abdul Rahim, a PMTD Committee Member, spoke on Mega Projects in Malaysia, sharing crucial insights on the risk management strategies involved in large-scale project execution.

Educational Engagement

To inspire the next generation of engineers, the outreach programme included interactive sessions at Far Eastern University (FEU). The PMTD committee members delivered guest lectures on career opportunities in project management and engineering, covering a range of topics from digital transformation to sustainable practices. Topics presented included Contracting Strategy (by Ts. Ir. Dr. Harris Abd. Rahman Sabri), Project Management & ICT (Ir. Dr. Azhar Arif), Mega Projects Driving Malaysia's Economic Growth (Dr. Abd. Rahman Abdul Rahim), Communication Management (Ts. Ainarull Assikin Hadi), Project Regulatory Compliance and Governance (Ir. Vincent Wong Khien Ngee), and Project Management Software & Tools (Ts. Ir. Wan Rizaluddin Abdullah Wan Ali). These sessions were followed by panel discussions which addressed student queries on bridging the gap between academic learning and industry requirements.

Following the guest lectures, the PMTD team met with the College of Engineering at FEU to explore a formal partnership. The meeting focused on potential collaborations in research initiatives and professional development, with both parties discussing the framework for a future Memorandum of Understanding (MoU). The MoU was intended at formalising the collaboration, paving the way for long-term cooperation in advancing engineering education and project management practices across the region.

Photo session with the office bearers of the PTC-WEN

Conclusion

The outreach programme in the Philippines was a huge success, effectively fulfilling its objectives to foster professional networking, to promote knowledge exchange, and to advocate for STEM education. This served as a testament to the value of international collaboration and the shared commitment to advance the engineering profession. It also highlighted the vital role of engineering and project management in addressing global challenges, empowering communities, and building a sustainable future. ■

Engineering a Future Without Dengue

by:

Ir. John Cheah Kam Loong P.I.S

Dengue fever is a significant public health challenge in Malaysia and many tropical regions, with outbreaks causing widespread illness and straining healthcare systems. Without proper prevention, dengue can cause severe complications such as internal bleeding, organ failure, and even death, with second infections often being even more dangerous. Dengue not only endangers lives but also overwhelms healthcare systems and burdens families with medical costs.

However, the IEM (Southern Branch) Ad-Hoc Committee on Dengue Control has shown how engineers, armed with technical expertise and innovative strategies, are playing a pivotal role in combating this mosquito-borne disease.

On 5 February 2024, Johor Bahru Rotary Club President Rtn. Steven Wu presented the IEM Guidelines to District Officer Tuan Haji Muzaldin Mohamed. Looking on were Ir. Bong Beng Siong, Dato Ir. Mohd Noh Ibrahim, Dato Ir. Lim Chow Hock, Ir. John Cheah Kam Loong and Ir. Thayala Selvaduray

Under the leadership of key figures such as Ir. John Cheah Kam Loong, Dato' Ir. Lim Chow Hock, and Ir. Prof. Dr. Hayati Abdullah, the committee has spearheaded initiatives that merge engineering principles with public health action. Their work proves that engineers have the knowledge and the way to "Fight the Bite", transforming theory into life-saving interventions.

Here are some key contributions of the IEM (SB) Ad-Hoc Committee in the fight against dengue.

Dato' Ir. Lim Chow Hock presented the IEM Guidelines on Prevention & Control of Dengue to Tuan Ir. Ts. Mohd Fazli Salleh. Also present were Ir. Dr. Norlida Buniyamin, Ir. Thayala Selvaduray, Ir. John Cheah Kam Loong and Assoc. Prof. Ir. Dr. Hayati Abdullah

1. Developing Engineering-Based Guidelines for Dengue Control

The cornerstone of the committee's efforts is the IEM Guidelines for the Prevention & Control of Dengue, a comprehensive document that provides actionable strategies for mosquito control. The Guidelines was developed through rigorous research, field testing, and collaboration with health authorities. Among the key contributions, the team successfully:

- Presented the Guidelines to government officials, including Johor Menteri Besar representative Y.B. Tuan Ir. Ts. Mohd Fazli Salleh, ensuring policy-level adoption.
- The Guidelines was showcased internationally at the 2024 Rotary Convention in Singapore, highlighting Malaysia's leadership in dengue mitigation.
- It was used as a training manual for local authorities, emphasising structural and environmental modifications to eliminate breeding sites.

Members of the IEM (SB) Committee Members receiving the Heart &Community Award. Back Row (l-r): Ir. Lim Chee Seng, Ir. Goh Kae Wan, Ir. Bryan Soh Chong Boon, Ir. Teo Boon Keng, Ir. Teo Kiyuee, Ir. Kamisan Turiman, Ir. Derek Cheah Kong Yew and Ir. Tony Tan Boon Tong. Front Row (l-r): Ir. Thayala Rajah C. Selvadurai, Dato Ir. Mohd Noh Haji Ibrahim, Ir. Assoc. Prof. Dr. Hayati Abdullah, Ir. John Cheah Kam Loong, Ir. Prof Dr. Jeffrey Chiang Choong Luin, Dato Ir. Lim Chow Hock, Ir. David Puen Ming Shen

We engineers have the knowledge and the way to "Fight the Bite" and the Guidelines is testament to how technical expertise can shape effective public health strategies.

2. Empowering Communities Through Training & Social Engineering

Beyond policy, the committee also actively engaged communities to foster sustainable dengue prevention through the following:

- Training programmes, such as the February 2024 session for Johor Bahru's Dengue Action Committee, to educate officials on social engineering, mobilising residents to remove stagnant water and to adopt preventive behaviours.
- Partnerships with professional associations such as the Rotary Club's amplified outreach, distributing the Guidelines and organising awareness campaigns.
- Interactive forums featuring experts such as Ir. Thayala Selvaduray and Dato' Ir. Mohd Noh Ibrahim, to reinforce the message that dengue control is a shared responsibility.

These approaches ensure that engineering solutions are not just theoretical but are also actively implemented at grassroot levels.

3. Recognition & Pushing Ahead

The IEM (SB) committee's relentless efforts were honoured with the Heart of Community Award in August 2024. However, the fight is far from over. We engineers have the knowledge and the way to "Fight the Bite", but success depends on sustained commitment from all stakeholders.

The IEM (SB) Ad-Hoc Committee's work exemplifies how engineering expertise can drive meaningful change in public health. By combining technical guidelines, community engagement, and policy advocacy, they have shown that dengue is not an insurmountable problem.

As dengue continues to threaten communities, the committee's model offers a blueprint for others to follow. The message is clear: When engineers and public health professionals unite, lives are saved and outbreaks prevented. The fight against dengue is ongoing but, with science, strategy, and solidarity, victory is within reach. Let us continue to "Fight the Bite" together. ■

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HCMC Through an Engineer's Lens

Photography by:
Ir. Dr. Norshah Hafeez Shuaib

In mid-December 2024, I travelled to Ho Chi Minh City (HCMC) for a business meeting and I viewed it through an engineer's eyes. Day 1 revealed incredibly busy streets with a huge number of motorbikes; crossing roads required heightened awareness. There were lots of construction signs for the HCMC Metro and all around the city, ongoing construction sites signalled the country's rapid rise.

Executing these developments in a packed city is a huge project and risk management endeavour, one that required meticulous planning. I saw the Notre Dame Cathedral being carefully fixed. As an engineer, I recognised the challenges of preserving old buildings, ensuring safety, and incorporating modern features.

On Day 2, I visited the War Remnants Museum, a showcase of Vietnamese strength and unity, the key reasons for the country's impressive growth. A walk along the Saigon River showed a rapidly progressing city that was still strongly connected to its past. HCMC, through an engineer's eyes, clearly demonstrated how engineering underpinned a thriving nation's development. ■

Ho Chi Minh statue in the City Centre

Date: 22 August 2025

To all Members,

LIST OF CANDIDATES ELIGIBLE TO SIT FOR THE PROFESSIONAL INTERVIEW FOR THE YEAR 2025

The following is a list of candidates who are eligible to sit for the Professional Interview for the year 2025.

According to the IEM Bylaws, Section 3.8, the names listed below are published as eligible candidates to become Insitution Members, provided that they pass the Professional Interview in 2025.

If there are any Corporate Members who have objections against any candidate deemed unsuitable to sit for the Professional Interview, a letter of objection can be submitted to the Honorary Secretary, IEM. A letter of objection must be submitted within one month from the date of publication.

Ir. Chen Harn Shean
IEM Honorary Secretary

NEW APPLICATION

NAME	QUALIFICATION
CIVIL ENGINEERING	
MOHD FARID IKRAM BIN ABU SAMAD	BE HONS (UiTM) (CIVIL, 2008)
AHMAD ZIMY BIN AHMAD SHUKRI	ADV DIP (ITM) (CIVIL, 1992)
ELECTRICAL ENGINEERING	
MOHAMMAD SYAFIQ BIN SAHARUDIN	BE (UTM) (ELECTRICAL, 2016)
MUHAMMAD HARIZ BIN RAIZAL	BE (UNITEN) (ELECTRICAL POWER, 2017)
LEE KAH SOON	BE HONS (UM) (ELECTRICAL, 2018)
MECHANICAL ENGINEERING	
MUHAMMAD DZULKIFLI BIN ABD AZIZ	BE HONS (ROYALE MELBOURNE INSTITUE OF TECHNOLOGY) (MECHANICAL, 2016)

APPLICATION FOR CORPORATE MEMBER

NAME	QUALIFICATION
CIVIL ENGINEERING	
WAN AHMAD SYAHMI BIN W. RAZAK	BE HONS (UM) (CIVIL, 2011)
ELECTRICAL ENGINEERING	
CHONG KIM SOON	BE (UKM) (ELECTRICAL & ELECTRONIC, 2012) MSc HONS (UKM) (ELECTRICAL, ELECTRONIC & SYSTEM ENGINEERING, 2015) PhD (UKM) (2019)
CHEMICAL ENGINEERING	
MOHAMMAD AZIZOL BIN SHAFIEE	BE HONS (USM) (CHEMICAL, 2015)

MEMBER TRANSFER

MEMBERS NO.	NAME	QUALIFICATION
AEROSPACE ENGINEERING		
94287	NUR SYAHIBRAHIM BIN MAHMUDIM	BE HONS (IIUM) (AEROSPACE, 2014) MSc (IIUM) (MECHANICAL, 2024)
CIVIL ENGINEERING		
130275	LAI HON WENG	BE (UNITEN) (CIVIL, 2004)
107642	LIM WAI LOON	BE HONS (UTP) (CIVIL, 2018)
53626	TEOH SHI SHENG	BE HONS (UKM) (CIVIL & ENVIRONMENTAL, 2013)
129456	HO SUI CHUAN	ME HONS (UNI. OF NOTTINGHAM) (CIVIL, 2016)
117149	MUHAMMAD TAUFIK BIN MOHD SAID	BE HONS (UNITEN) (CIVIL, 2018)
107999	LEONG CHING YI	ME HONS (IMPERIAL COLLEGE LONDON) (CIVIL, 2019)
ELECTRICAL ENGINEERING		
116480	MOHD SYAHEZAN BIN ABU HASHIM	BE (UTM) (ELECTRICAL-ELECTRONICS, 2014)
22457	LO YEE HANG	BE HONS (UNI. OF HERTFORDSHIRE) (ELECTRICAL & ELECTRONIC, 1998)
96374	TAN SHIH MING	BE HONS (SWINBURNE UNI. OF TECH) (ELECTRICAL & ELECTRONIC, 2017)
MECHANICAL ENGINEERING		
16676	ARAHMAN BIN JAMEL	BE HONS (UTM) (MECHANICAL, 1993)
37300	TEO WEI KHER	BE HONS (UNI. OF SHEFFIELD) (MECHANICAL, 2002)
CHEMICAL ENGINEERING		
99434	AHMAD DZUHRI BIN JAAFAR	BE HONS (UTM) (CHEMICAL-BIOPROCESS, 2008) ME (UTM) (BUSINESS ADMINISTRATION, 2020)

TRANSFER TO CORPORATE MEMBER

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CIVIL ENGINEERING		
130916	NURUL NAQILA BINTI SHAMSUDDIN	BE HONS (UTP) (CIVIL, 2016) ME (UTP) (WATER, 2023)
29165	CHANG LEONG SEN, PETER	BE HONS (UTM) (CIVIL, 2006)
19137	OOI FA YONG	BE HONS (UTM) (CIVIL, 2000)
111823	CHEW YUN LIEH	BSc HONS (UNI. OF WOLVERHAMPTON) (CIVIL, 2006) ME (UTM) (CIVIL, 2013)
121616	SAIFFUDIN BIN SAFIEE	BE HONS (UTM) (CIVIL, 2013)
84781	CHAN AL VIN	BE (UM) (CIVIL, 2016)
CHEMICAL ENGINEERING		
60761	ANUAR BIN ABDULLAH	BE HONS (UTP) (CHEMICAL, 2016)
ELECTRICAL ENGINEERING		
116152	MUHAMMAD DANIAL BIN MOHD KHAZAIE	BE HONS (UNITEN) (ELECTRICAL POWER, 2020)
87386	NUR SYAZWANI BINTI ISHAK	BE HONS (UNISEL) (ELECTRICAL, 2013)
36816	MANIRAJAH A/L SUBRAMANIAM	BE (UTM) (ELECTRICAL, 2005)
90105	CHONG SHENG XIN	BE (UTAR) (ELECTRICAL & ELECTRONIC, 2016)
MECHANICAL ENGINEERING		
84737	PRECIN A/L KALISALVAN	BE HONS (UM) (MECHANICAL, 2019)
77600	RAHIM NOOR BIN YUSUF	BE HONS (UNIMAS) (MECHANICAL & MANUFACTURING, 2018)
MARINE ENGINEERING		
117380	DANGEH ANAK NAWIL	COC MARINE CLASS 1 (AKADEMI LAUT MALAYSIA) (2024) BE (JMTI) (INDUSTRIAL TECHNOLOGY, 2023)
MATERIAL ENGINEERING		
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info@dimensionpublishing.com

Joseph How
+6011 1234 8181

Shirley Tham
+6016 283 3013