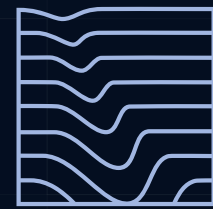


**United
Engineering
Consortium**



**United
Engineering
Consortium**

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Executive Summary

United Engineering Consortium is a strategic alliance formed by Ingiter, Cimmeria Consulting, and ES Calculations, which represents a natural step in the evolution of collaborations between the three teams over recent years. We share the same vision for the present and future of engineering, as well as a common philosophy regarding our vocation for customer service. Our members have extensive experience in a wide variety of projects, covering both geological-geotechnical engineering and consulting projects, as well as structural design. In this context, the alliance has been established with the aim of combining resources and specialised knowledge, implementing both existing solutions and producing new *ad hoc* methods for unconventional problems. Thus, our consortium is dedicated to offering integrated and sustainable engineering solutions, aimed at addressing the challenges of global construction and the development of infrastructure and buildings.

Consortium Vision and Mission

Vision:

To become a global reference in engineering solutions and consulting, expanding our influence through innovation and collaboration, and a commitment to our clients' success. We aspire to be innovators in structural design, pushing civil engineering beyond its traditional boundaries to create viable and safe structures that positively impact the world.

Mission

Providing custom structural and geotechnical solutions tailored to our clients that ensure technical excellence and budgetary efficiency, reflecting the changing demands of the global construction landscape. Our experience across five continents allows us to adapt with great ease to different psycho-environmental settings and the changing international regulatory landscape. Thus, we aim to guide companies towards a future where ethical operations and environmental responsibility are complementary, adding value to each project and further enhancing our clients' prestige.

Benefits and Synergies of Collaboration

United Engineering Consortium benefits from Ingiter's specialisation in geotechnical consulting, structural design, and geophysical analysis, with the flexibility and focus on sustainable solutions of Cimmeria Consulting in the geological-geotechnical field, and the global perspective and innovation in structural design of ES Calculations.

Together, we merge our collective capabilities to create the cornerstone that provides a comprehensive approach at every construction phase, from design to execution, with a firm commitment to excellence, innovation, and corporate responsibility. This allows us to offer outstanding solutions that transform engineering concepts into reality. From our alliance, we aim to continue providing our clients with the peace of mind and confidence that was already the hallmark of our companies.

Consortium Profile

United Engineering Consortium is the result of the union of three firms with a legacy of innovation and excellence in engineering: Ingiter, Cimmerica Consulting, and ES Calculations. Our story begins with the convergence of individual paths, each marked by significant achievements in the field of geological-geotechnical and geophysical engineering and consulting, as well as structural design and forensic engineering of structures.

History and Formation of United Engineering Consortium

Ingiter originated at the University of Burgos in 2009, emerging as a company specialised in geotechnical consulting and soil analysis, with a high component of innovation in the field of applied geophysics. Cimmerica Consulting, established in 2019 in the United Kingdom, brought to the table a philosophy of adaptability and sustainable solutions in geology and geotechnical engineering for civil projects. ES Calculations, with its global vision and commitment to innovation in structural design, has been instrumental in carrying out highly complex civil and architectural projects.

Our initial collaborations were aimed at large-scale projects, with structural elements, containments, and foundations of great complexity both in design and in terms of construction foresight, allowing us to quickly fine-tune our synergies. These first contacts convinced us of the benefits that could exist along a common path.

The formation of our consortium not only symbolises the union of three successful business stories but also the fusion of our respective strengths to form a more robust entity. Together, we embark on a shared mission to provide integrated solutions ranging from geological-geotechnical analysis to advanced structural design, backed by solid research in the field of new construction solutions or geophysical recognition and a focus on sustainability and efficiency.



Services Overview

Infrastructure Development & Urban Planning: Planning and design of highways, roads, railways, subways, and residential and industrial developments.

Field Study and Research: Utilisation of advanced technologies for precise mapping and characterisation of the subsurface at project sites. In-situ and laboratory evaluations to determine the fundamental properties informing the design of foundations and containment structures. Meticulous studies for environmental impact management and water behaviour analysis, essential for the design of hydraulic infrastructure.

Geotechnical Engineering: Comprehensive geotechnical services, from design to specification of works, numerical analysis for soil-structure interaction, and design of retaining walls, slope stability, liquefaction, among other activities.

Geological Engineering: Geological risk assessment, field mapping, geomorphology, and terrain modelling (terrestrial and marine). Geotechnical characterisation (terrestrial and marine), soil and rock engineering, design of shallow foundations, settlement analysis, and supervision of geotechnical investigations. Specialised seismic risk analysis: probabilistic seismic hazard assessment studies, evaluation of ground behaviour in response to vibrations.

Temporary Works & Support during the Construction Phase: Consultancy in Temporary Works, including analysis of lifting sequences, temporary retaining walls, formwork and falsework, and special solutions for bridges and roads. Design of custom work platforms, monorail crane systems, and support for equipment and machinery.

Services Overview

Structural Engineering: Design and structural analysis for a wide range of projects, from residential buildings to critical infrastructures like bridges. Direction of load testing on passageways and buildings.

Forensic Engineering: Investigation of failures in structures, foundations, containments, slopes, linear works, materials, products, or construction systems. With over 20 years of experience in the field of structural and geotechnical pathology, we use engineering principles and scientific methods to determine the causes of accidents or structural failures, both to provide solutions for reinforcement or improvement and for legal advice during legal processes of responsibility clarification.

Preservation & Rehabilitation of Structures: Evaluation and diagnosis of existing structures, including feasibility studies, life cycle analysis, and strategies for monitoring and maintenance, as well as the design of reinforcement or repair systems when necessary.

Hydraulic & Maritime Engineering: Hydrological, hydraulic, and fluvial analysis, focused on flood mitigation. Design of river channeling, analysis of bridge scour, and design of culverts. Hydrodynamic simulations in rivers and estuary environments, including marine agents (tides, wind, etc.).

Renewable Energies: Consultancy for solar and wind energy projects (terrestrial and marine), as well as for hydroelectric, thermosolar, etc., projects.

Third Party Checker & Audit Services: Independent and objective review of the designs, calculations, and specifications of a project. The aim is to identify and mitigate risks, ensuring the safety, functionality, and long-term viability of the construction project, as well as to optimise those aspects that are susceptible to improvement.



Infrastructure Development & Urban Planning

The consortium specialises in the planning, design, and execution of infrastructure and urban planning projects, ranging from the creation of new urban developments to the modernisation of existing infrastructures. With a focus on the integration of sustainable technologies and innovative practices, the consortium offers comprehensive solutions that include:

- **Urban Planning and Sustainable Design:** Creation of urban spaces that promote quality of life, with a focus on environmental sustainability and social inclusion. Implementation of smart and efficient transportation systems that connect metropolitan areas with ease and efficiency.
- **Transport Infrastructure:** Design and construction of roads, bridges, tunnels, and mass transit systems that form the backbone of transport in modern cities. These projects are managed with a focus on minimising environmental impact and maximising long-term functionality.
- **Building Construction and Public Spaces:** Creation of buildings ranging from residential housing to industrial complexes, including the revitalisation of public spaces to enhance community interaction and promote culture and art.
- **Consultancy and Project Management:** Consultancy services covering from project conception to delivery, ensuring that each phase meets the highest standards of quality, within budget and on schedule.



Field Study and Research

The Field Study and Research service at United Engineering Consortium focuses on the collection and analysis of data directly from the construction or project environment. This comprehensive approach is crucial to ensuring that all aspects of engineering and design are informed by the most accurate understanding of local conditions. Services include:

Phase 1 - Topographical Surveys and Preliminary Geophysical Characterisation:

Utilisation of advanced non-destructive technology to map the terrain geometry and the morphological and mechanical characteristics of the subsurface at the project site, laying the groundwork for planning detailed characterisation activities and design in the office.

Phase 2 - Subsoil Analysis:

Conducting in-situ and laboratory tests to determine the physical and mechanical properties of the ground at the project site, which are critical for the design of foundations and containment structures or the analysis of slope stability, among other activities.

Phase 3 - Desktop Analysis:

- **Environmental Assessments:** Detailed studies to identify and mitigate potential environmental impacts of projects, ensuring compliance with local and international regulations.
- **Hydrological and Hydrogeological Studies:** Analysis of the behaviour of surface and groundwater to support the design of drainage projects, the management of stormwater, or the construction of hydraulic structures.
- **Feasibility Analysis:** Preliminary evaluations to determine the technical and economic viability of projects, considering site conditions, logistics, and potential construction challenges, serving as a guide for private companies and administrations during the bidding processes.

Geotechnical Engineering

Our geotechnical services within the United Engineering Consortium cover a broad spectrum of solutions aimed at ensuring structural and geotechnical stability and safety in relation to ground behaviour. Here are the key components of this specialisation:

Geotechnical Studies and Terrain Analysis: Conducting detailed studies to assess the properties of soil and rock at potential construction sites, providing essential data for design and planning of the construction.

Ground Improvement and Slope Stabilisation: Implementation of advanced techniques to enhance the ground characteristics, including slope stabilisation and mitigation of landslide risks.

Groundwater Management: Design of underground drainage systems, analysis of seepage and its effects on buried structures, and groundwater management strategies to protect structures and maintain site integrity.

Risk Analysis and Management of Geotechnical Hazards: Assessment of geotechnical risks such as settlements, seismic threat, liquefaction, problems of expansivity or soil collapse, among others, providing strategies for their management and mitigation.

Innovation in Techniques and Materials: Incorporating the latest advances in geosynthetics, geogrids, and other emerging technologies for the optimisation of geotechnical projects. This section also includes cutting-edge research techniques such as drone photogrammetry or the application of LiDAR technology.

Advanced Numerical Analysis: With specific tools like Plaxis 3D or the RocScience suite, complex soil-structure interaction models can be created to optimise the involved structures as well as to evaluate their behaviour in highly complex contexts.

Geological Engineering

Within the United Engineering Consortium, Geological Engineering is a service area that combines a deep understanding of geology with practical application in projects. This field is essential for ensuring that the interactions between the earth and man-made structures are understood and effectively managed. Here are the key services described:

- **Geological Mapping and Geotechnical-Geological Modelling:** Modelling and geotechnical characterisation of geological formations for planning field campaigns and subsequent geotechnical-structural design.
- **Design and Supervision of Geotechnical and Geophysical Campaigns:** Planning of geotechnical and geophysical campaigns after analysing geological information in order to geotechnically characterise the materials affected by the infrastructure.
- **Identification and Assessment of Geological Risks:** Identification of risks and assessment of the probability and impact of the risk of the project to be designed.
- **Geomorphology and Hydrogeology:** Study of the shape and evolution of the terrain and its relationship with groundwater, key for projects that require water resource management and erosion prevention.
- **Slope Stability Analysis:** Assessment of the stability of natural and artificial slopes, and design of measures to prevent failures and ground movements.
- **Consultancy for Excavations and Tunnels:** Specialised advice on the planning and execution of excavations and tunnels, ensuring structural integrity and safety.

Temporary Works & Support during Construction Phases

1. Design & Analysis.

- Formwork design
- Analysis of lifting sequences
- Temporary retaining walls
- Special foundations for temporary works
- Analysis of the impact of temporary works on permanent structures
- Study and analysis of complex construction sequences
- Geotechnical engineering analysis for temporary structures

2. Bridges & Infrastructure.

- Analysis of lifting processes
- Formworks and Falseworks
- Ground stability verifications
- Retaining walls for roads and bridges
- Gantries and special temporary work solutions for bridges

3. Equipment & Machinery.

- Custom platforms
- Custom lifting systems (e.g., monorail cranes)
- Cranes and vertical transports: construction elevators and material lifts.
- Special mast bracings and verifications of permanent structure
- Foundations for cranes, climbing masts, special formworks
- Custom components for rack-and-pinion lifting equipment and suspended platforms



Structural Engineering

Structural Engineering at the United Engineering Consortium represents a cornerstone of our services, providing essential design and structural analysis for the viability and safety of construction projects. This comprehensive service includes:

- **Structural Design:** Creation of structural solutions for buildings, bridges, and other civil constructions, ensuring strength, stability, and compliance with building codes.
- **Advanced Structural Analysis:** Use of modelling and simulation software to evaluate the response of structures under static and dynamic loads, including the impact of seismic phenomena and extreme weather conditions.
- **Optimisation of Materials and Construction Methods:** Selection of materials and construction techniques that optimise efficiency and costs without compromising structural integrity.
- **Evaluation and Reinforcement of Existing Structures:** Inspection and analysis of existing buildings and structures, with recommendations for their maintenance, improvement, or reinforcement to extend their lifespan.
- **Consultancy for Large-Scale Projects:** Expert advice for large infrastructure projects, working closely with architects, engineers, and builders to carry out complex and technically challenging designs, within any national and international regulatory framework.
- **Innovation in Sustainable Design:** Integration of sustainable and ecological design principles to minimise the environmental impact of constructions and promote energy efficiency.

Preservation & Rehabilitation.

The Preservation and Rehabilitation service for civil or building works seeks to ensure their functionality and safety, allowing their useful life to be rationally extended for future generations. Services include:

- **Structural Diagnosis:** Evaluations use both intrusive and non-destructive techniques to detect structural problems in buildings. These address issues ranging from concrete pathologies, metal corrosion, to consequences of critical events such as earthquakes, explosions, or fires, offering a comprehensive view of potential damages and their origins.
- **Historical Restoration:** Specialised work on heritage buildings, applying restoration techniques that respect the historical and artistic integrity of the structures.
- **Reinforcement and Improvement of Structures:** Implementation of technical solutions for structural reinforcement, such as the addition of new elements or the improvement of existing ones, to comply with current regulations and improve seismic resistance, harmonising the use of vernacular techniques and materials with the use of cutting-edge technological solutions.
- **Functional Adaptation:** Modification of spaces to adapt them to new uses, ensuring that transformations meet modern safety and accessibility standards.
- **Sustainability in Rehabilitation:** Incorporation of sustainable technologies and practices to reduce the environmental impact during the rehabilitation process and improve the energy efficiency of properties.
- **Conservation Management and Planning:** Development of long-term maintenance plans to ensure continuous conservation and effective management of properties.

Forensic Engineering

The Forensic Engineering service at United Engineering Consortium addresses the critical need to investigate and analyse structural and/or geotechnical failures, material durability issues, and/or construction defects. This specialised field combines principles of engineering and science to determine the causes of incidents and failures in existing structures. Key aspects include:

- **Analysis of Structural Failures:** Detailed investigation of structural collapses and failures in components to identify underlying causes, from design errors to material failures.
- **Damage Assessment from Disasters:** Examination of structures affected by catastrophic events.
- **Technical Expertise in Litigation:** Expert support in construction-related litigation and arbitration, providing objective and evidence-based assessments to resolve legal disputes.
- **Recommendations for Repair and Reinforcement:** Development of repair or reinforcement strategies for damaged structures, ensuring their safe restoration in accordance with current regulations.
- **Risk Prevention:** Advice on best design, construction, and maintenance practices to minimise the risk of future collapses or progression to ruinous states, thereby ensuring the long-term integrity of structures.



Hydraulic & Maritime Engineering

Hydraulic and Maritime Engineering at United Engineering Consortium encompasses a wide range of services designed to address the challenges of water management and infrastructure development in aquatic environments. This service focuses on creating sustainable and efficient solutions for projects ranging from flood control to the design of maritime ports. Key aspects include:

Design of Hydraulic Structures: Development of dams, channels, locks, and drainage systems that effectively respond to water control and distribution needs, maintaining a focus on minimising environmental impact. This includes advanced numerical modelling of coupled hydraulic flow and deformation systems.

Flood Protection: Implementation of barriers, dykes, and other containment structures to protect urban and rural areas from flooding, as well as conducting simulations to forecast risk scenarios.

Port and Coastal Development: Planning and design of ports, marinas, and coastal defences, including breakwaters and erosion protection structures.

Environmental Impact Assessment: Detailed analysis of the impact of hydraulic and maritime projects on the environment, ensuring adherence to environmental regulations and promoting the conservation of aquatic ecosystems.

Maritime Engineering: Design and construction of infrastructures in the marine environment, including offshore platforms, anchorage systems, and submarine structures, with special focus on durability and resistance to extreme conditions.

Renewable Energies.

The United Engineering Consortium recognises the critical importance of renewable energies on the path towards a sustainable future. Our team of civil engineers brings unparalleled technical expertise and innovative vision to the development, implementation, and management of renewable energy projects, ensuring efficient, sustainable solutions tailored to global needs. Specialised services include:

Comprehensive Development of Solar and Wind Projects: From initial site assessment through to construction and commissioning of solar and wind farms, our civil engineers lead the creation of resilient infrastructures, designing robust foundations and support structures, and ensuring effective integration with existing electrical grids.

Optimisation of Renewable Resources: We utilise advanced modelling and simulation tools to assess and maximise the potential of available renewable resources, ensuring each project is designed for maximum energy efficiency and output.

Implementation of Hydroelectric and Biomass Projects: Our services cover the design and construction of infrastructures to harness the power of water and biomass, including the creation of dams, canalisation systems, and processing plants, with a firm commitment to minimising environmental impact.

Consultancy on Feasibility and Project Management: We offer consultancy services covering feasibility assessment, strategic planning, permit management, and construction supervision, ensuring that each renewable energy project is successfully developed from conception through to operation.

Third Party Checker

United Engineering Consortium stands out for its comprehensive Third Party Checker service in construction. Through an independent and expert perspective, our team offers assurances that projects not only comply with the highest standards of safety and regulation but also align with quality and performance expectations. The services provided are detailed below:

Design Review and Verification: Our specialists delve into the analysis of structural designs, reviewing every detail to ensure alignment with international and local construction codes. This process focuses not only on structural integrity but also on the functionality and efficiency of the design, promoting innovations that can offer significant savings and increase the project's sustainability.

Compliance and Risk Auditing: Through a comprehensive approach, we assess the project's adherence to all relevant regulations, including environmental, safety, and occupational health standards. We proactively identify any potential risk that could affect the project's viability, offering clear recommendations for mitigation. This audit extends to the review of project documentation, ensuring integrity and transparency at all stages.

Quality Supervision in Construction: Throughout the construction phase, we provide detailed supervision to verify that the works are carried out according to the approved plans and specifications. Our team is on the ground, ensuring that the highest quality standards are maintained and that any deviations are corrected in a timely manner. This ongoing supervision is essential to prevent costly errors and to ensure that the project is completed within the established timelines and budgets.

Training

The United Engineering Consortium provides specialised training aimed at companies and professionals seeking to deepen their knowledge and skills in geotechnical engineering and structural design. Our focus on customised training allows us to tailor content and methodologies to the specific needs of each client, ensuring relevant and applicable learning.

Customised Courses: We develop training programs that align with the objectives and particular requirements of each organisation. This includes tailoring the topics covered, from basic fundamentals to advanced techniques in geotechnical engineering and structural design, ensuring that the content is directly applicable to the projects and challenges faced by participants.

Practical and Applied Focus: Our teaching methodology emphasises practical learning, incorporating real case studies, simulations, and design exercises that reflect real-world situations. This facilitates the understanding of complex concepts and enhances participants' ability to effectively apply their knowledge.

Use of Advanced Technology: We incorporate industry-leading tools and software into our training curriculum, allowing participants to become familiar with the technologies they will use in their daily work. This includes finite element modelling programs, geotechnical analysis software, and structural design tools.

Continuous Development: In addition to specific courses, we offer ongoing professional development programs so that engineers and designers can keep up with advancements in their field, including regulatory changes, technological innovations, and emerging best practices.



Puhoi – Warkworth Motorway Project: A Green Corridor

In 2023, we look back at one of New Zealand's most transformative infrastructure projects: the extension of the Northern Motorway, spanning from Pūhoi to north of Warkworth, a significant segment of the Ara Tūhono project. Encompassing 18.5km, the initiative was meticulously orchestrated to bolster road capacity, notably enhancing road safety while ensuring swift commutes in the pulsating region around Auckland. The project's leadership comprised a powerful collaboration between the New Zealand Transport Agency (NZTA), its PPP partner Northern Express Group, and a construction consortium led by NX2, a Joint Venture of Fletcher Construction and the Spanish powerhouse, Acciona.

We proudly contribute to the construction of the Okahu and Puhoi bridges, devising intricate lifting plans, and ensuring the structural adequacy and stability of permanent structures throughout their construction and lifting phases. While the motorway was entrusted to the NX2 consortium for its operation over a span of 25 years, it remains a valuable public asset, embodying the spirit of public-private collaboration. As the motorway stands today, it's not just a testament to engineering prowess but also to the synergistic efforts of diverse stakeholders sharing a unified vision for a more connected New Zealand."

*We were commissioned for the Okahu and Puhoi bridges initially and subsequently for a crossing (Watson Bridge & Kauri Eco).

Location:

- 4043799.62 - N
291214.29 - E
Puhoi,
New Zealand

OUR KEY ACCOMPLISHMENTS.

- Lifting plans development. **Completed**
- Ground improvement with causeway. **Completed**
- Ensuring stability of permanent structures in all phases. **Completed**
- Ensuring structural adequacy during construction & lifting **Completed**

PUHOI VIADUCT

OKAHU VIADUCT

Etihad Rail Project (Phase 2): Efficient Desert Transit.

Railways etched a significant mark in history, standing out as one of the most sustainable, efficient, and safe modes of transportation. In the GCC, the past rejuvenation of rail infrastructure symbolised unparalleled progress, technology, and sustainability. The UAE's vision materialised prominently through the ambitious Etihad Rail project, which not only connected the main emirates but also became an essential segment of the \$100bn GCC rail programme. We partnered with Hadeed Steel Industries and worked for esteemed companies such as China State Construction Engineering Corporation Ltd., China Railway Construction Corporation (CRCC), and Ghantoot Transport & General Contracting Company, diving deep into the project's complexities.

We take immense pride in our significant contributions to this transformative endeavour. We executed state-of-the-art ground improvement techniques, crafted specialized foundation solutions tailored to the region's unique geology, and rigorously analysed settlements for enduring stability. In this intricate tapestry, we executed the construction of approximately 60 gantries using pioneering formwork/falsework techniques and shielded the railway's utilities with protective slabs and additional gantries. Through unwavering dedication and innovation, both Hadeed Steel Industries and ES Calculations played pivotal roles in sculpting a project that stands as a testament to engineering excellence and a future-driven mindset.

OUR KEY ACCOMPLISHMENTS.

- Executed ground improvement techniques. **Completed**
- Developed specialized foundation solutions. **Completed**
- Conducted comprehensive settlement analysis. **Completed**
- Constructed approximately 60 gantries with formwork/falsework. **Completed**
- Implemented utility protections, including protective slabs and gantries. **Completed**

Legend

- Phase 1 - - - - -
- Phase 2 - - - - -

Location:

2,796,708.03 - N
328,446.24 - E
United Arab Emirates



Malolos–Clark Railway Project CP N-04: Sustainable Transit.

The Malolos-Clark Railway Project (MCRP) CP N-04 is designed to revolutionise the way Filipinos navigate their daily lives. As a key segment of the envisioned 163km North-South Commuter Railway (NSCR) Project, the MCRP seeks to alleviate severe road congestion in Metro Manila and its neighbouring provinces. Specifically, the MCRP encompasses 6.3 km of the main line and an additional 1.6 km for the depot's access line. Notably, it also features an underground station serving Clark International Airport. The initiative promises a massive reduction in road congestion, slashing journey times dramatically. Beyond mere utility, it champions an environmentally conscious ethos, emphasising sustainable transport that respects our planet and reduces our

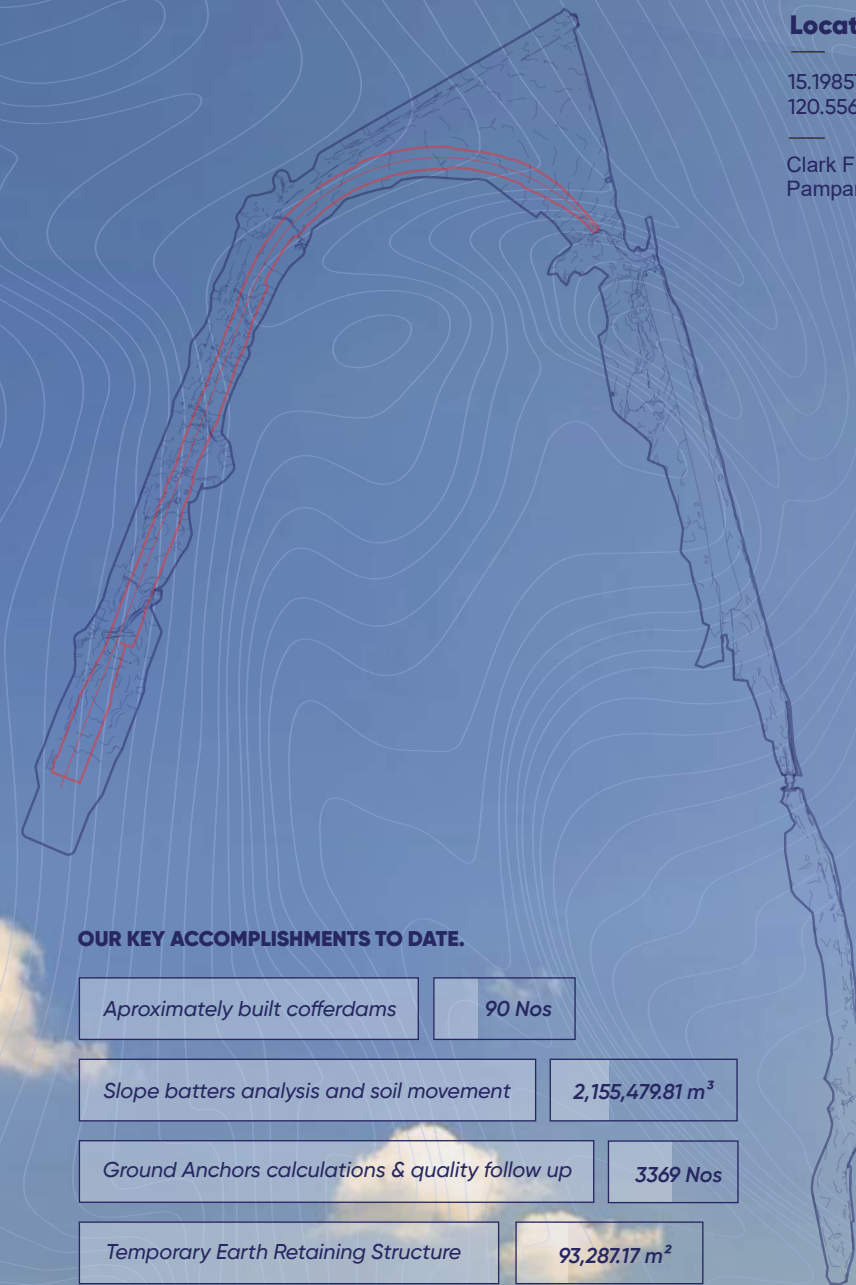
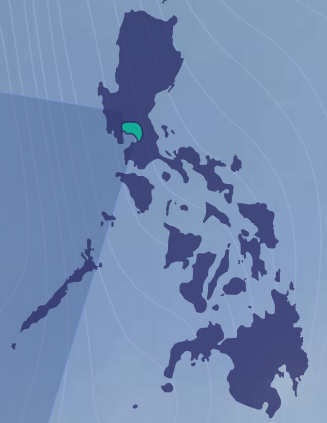
carbon footprint. Within this monumental framework, ES Calculations steps in with finesse and precision. Collaborating as a joint venture, Acciona Construction Philippines Inc. and EEI Corporation.

We're deeply committed to the vision of a transformative and sustainable Filipino transit system. Collaborating with key stakeholders and the nation's top engineers, we've built a partnership founded on trust, innovation, and a unified vision for a connected Philippines. As the Malolos-Clark Railway Project continues to take shape, our focus remains unwavering: to deliver excellence and ensure this railway stands as a symbol of national progress and readiness for the future.

Location:

15.198571 - N
120.556448 - E

Clark Freeport Zone,
Pampanga, Philippines.



OUR KEY ACCOMPLISHMENTS TO DATE.

Aproximately built cofferdams	90 Nos
Slope batters analysis and soil movement	2,155,479.81 m ³
Ground Anchors calculations & quality follow up	3369 Nos
Temporary Earth Retaining Structure	93,287.17 m ²



Rail Baltica Project : Connecting Europe with the Baltic States

Rail Baltica, a transformative rail project, represents a significant leap towards integrating Estonia, Latvia, and Lithuania with the broader European rail network. It's an ambitious greenfield infrastructure initiative with an electrified, double-track, standard gauge railway designed to facilitate fast, eco-friendly passenger and freight transport. Stretching approximately 870 kilometers across the Baltic States—392 km in Lithuania, 265 km in Latvia, and 213 km in Estonia—the project will enhance connectivity, enabling a design speed for passenger trains up to 249 km/h and for freight services up to 120 km/h. Notably, the infrastructure plans include seven international passenger stations and three multimodal freight terminals, strategically linking major urban centers and ports while fostering intermodality and multimodality. Funded through a €5.8 billion investment, primarily underpinned by the EU's Connecting Europe Facility, the project underscores a commitment to sustainable development, avoiding sensitive natural areas and integrating ERTMS for advanced rail traffic

management. Initiated in 2017, the project's construction phase is in full swing, aiming for a 2030 completion, with partial services launching by 2028. The Rail Baltica endeavor is managed by RB Rail AS, a joint venture coordinating design and construction, reflecting a synergy of technological innovation, regional cooperation, and visionary European transport policy.

The company collaborated with IDOM Engineering in the design of a section to be projected in Lithuania, which presents quite complex geological-geotechnical conditions for the construction of embankments and cuttings with heights exceeding 16m in extremely heterogeneous glacial materials. Additionally, the construction of the Neris River viaduct, with a length of 1.5km, as well as more than 20 additional structures, including overpasses, underpasses, and engineering works, is part of the project. This collaboration highlights the expertise and capabilities of both firms in managing and executing large-scale infrastructure projects in challenging environments.



KEY ACCOMPLISHMENTS

Geotechnical design of embankments and cuttings

- under construction

Modelling, characterisation, and geotechnical design for a 1.5km long viaduct over Neris River

- under construction

Modelling, characterisation, and geotechnical design of overpasses, underpasses, and engineering works

- under construction

Jubail Naval Airport: Rehabilitation of Wet Utilities.

The current Jubail Airport is an airfield 25 kilometres west of Jubail City in the Eastern Province of Saudi Arabia.

The original airport was designed in the late 70s, with construction starting in the early 80s and finishing in 1988, and the Royal Commission of Jubail approved it.

Regarding the condition of the existing wet utilities, the military, who operated the airport for many years, raised their concerns about the frequent leaks observed all over the utilities' pipelines, which reached around 10km long. Therefore, in 2019, an assessment was carried out to investigate the actual conditions, which showed that some replacement

and improvement were required for distribution pipelines (irrigation, sanitary waste, potable and electrical), potable pump stations and sewage lift stations, besides the necessity of new lift stations, water tanks and pump stations.

We proudly contribute to the geotechnical design of the rehabilitation and upgrading of the current wet utilities and associated ancillary elements to improve the safety and reliability of this systems, with more than 10km of pipelines, eight road crossings, two lift stations and two water tanks in challenging geological conditions, with the presence of sabkha deposits throughout the site.



Location

55.056965 - N
24.217294 - E

Al Jabayl
Saudi Arabia

KEY ACCOMPLISHMENTS

Modelling, characterisation and geotechnical design of 10km wet utilities -in the design phase.

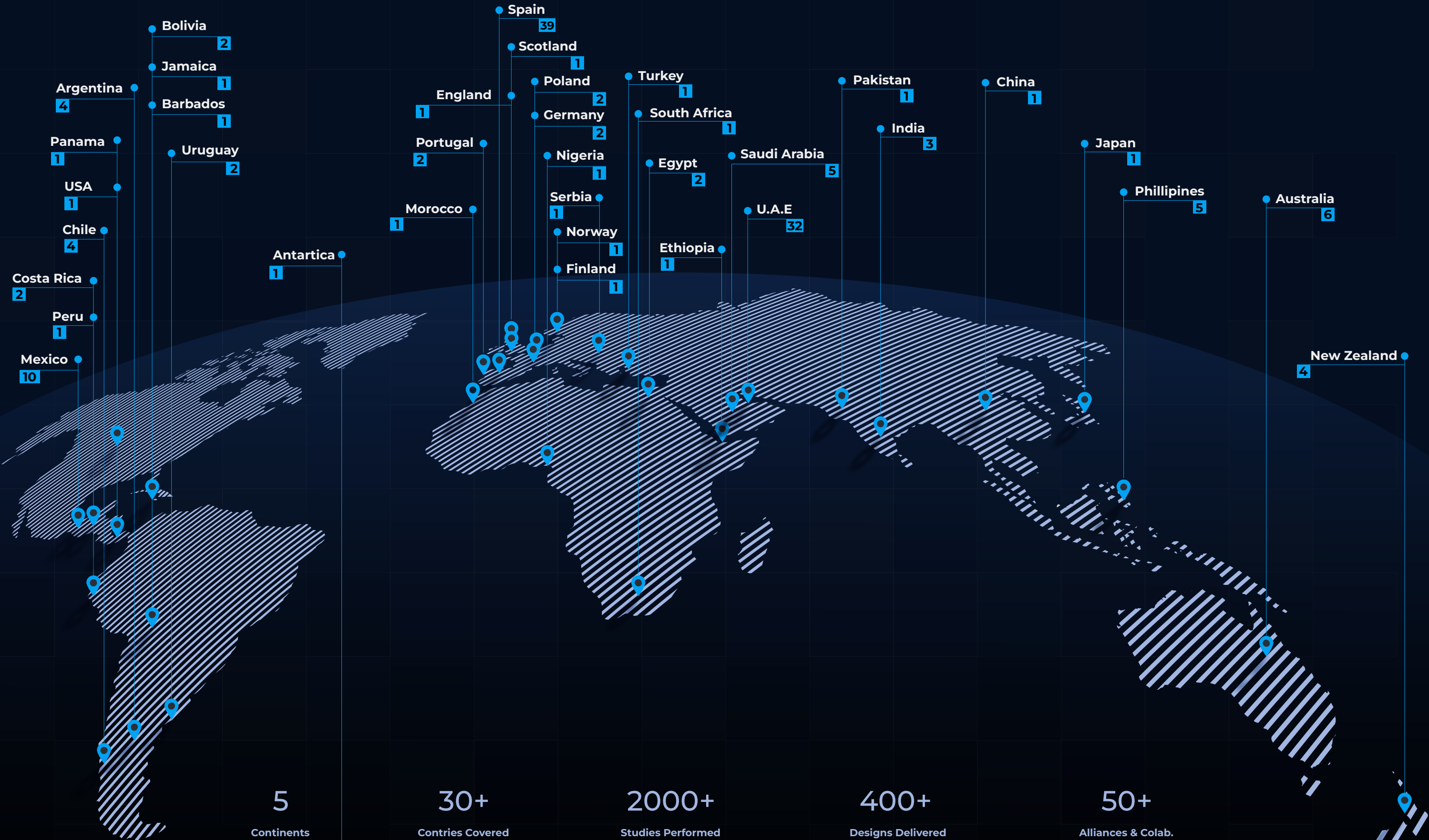
Finished

Modelling, characterisation and geotechnical design of road crossings - in the design phase

Finished

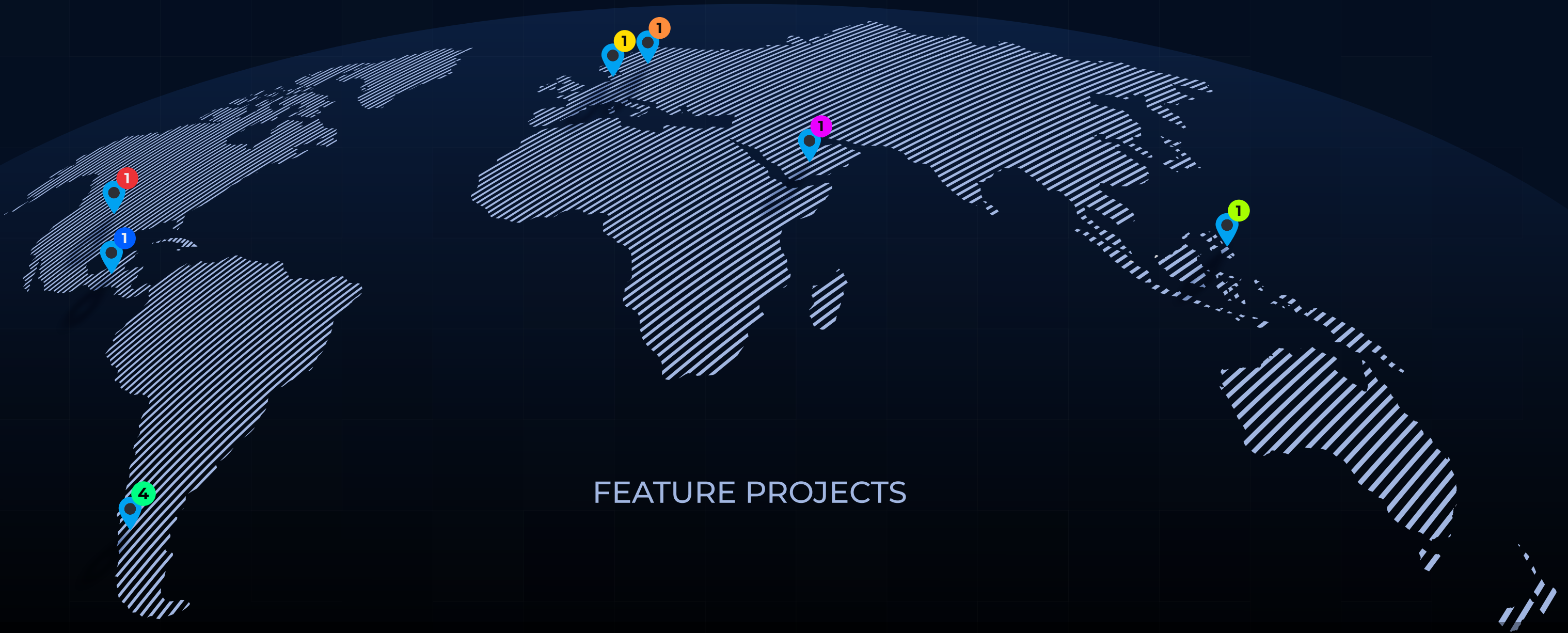
Modelling, characterisation and geotechnical design of Wet Wells and water tanks - in the design phase.

Finished



Country	City	Key Results
USA	Texas	Finite element model analysis in Plaxis 3D of foundations supported by post-tensioned piles.
Chile	Bío Bío	Design of gravel columns as a liquefaction mitigation measure in a wind farm.
Chile	Antofagasta	Scour study under wind turbines in a wind farm.
Chile	Malleco	Foundation optimisation in several wind farms in Malleco.
Chile	-	Slab design on gravel columns in a wind farm in Chile.

Country	Project	Key Results
Denmark	Nordhavnstunnel	Preliminary study of structural capacity and stability of cut and cover with groundwater table lowering analysis.
Lithuania	Rail Baltica	Geotechnical design for earthworks, viaduct over Neris River and structures
U.A.E	Expolin	Detailed design of large-span falsework for the execution of in-situ concrete box-girder bridges.
Phillipines	Jetty Port	Structural and stability verification during the construction phase of a continuous jetty for temporary use.
Mexico	Power Plant	Geotechnical design for a combined cycle power plant with a budget of 500 million euros.



FEATURE PROJECTS

Eng. Santiago Ortiz Palacio, Ph.D.

Director & Principal Engineer at Ingiter

Dr. Santiago Ortiz Palacios holds a Ph.D. in Civil Engineering, with a profound academic foundation from the Universities of Cantabria and Burgos. He continues his association with academia as an associate professor at the University of Burgos. His expertise and multidisciplinary passion span structural and geotechnical design, materials science, and forensic engineering in civil works and buildings. Notably, his work in seismic geophysics, where he earned his doctorate, stands out. Santiago has significantly contributed to engineering and education, actively participating in the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE).

Professionally, Santiago led the Burgos delegation of EPTISA, Servicios de Ingeniería S.L., before joining INGITER, in 2012. Here, he has persistently applied and broadened his expertise in geotechnics, structural engineering, and related fields. Through his academic and research endeavors, Santiago has authored six books on geotechnics and numerous articles in specialized journals or conference presentations. Recently, he expanded his teaching roles to include a seminar on applied geophysics for criminal investigation at the University of Alcalá de Henares, showcasing his dedication to spreading knowledge and pioneering innovation in engineering.



Santiago Ortíz
Dir. at Ingiter



Javier Carmona
Dir. at Cimmería



Eduardo Sendín
Dir. at ES Calculations



Víctor López
Ing. at Ingiter

Javier Carmona, Cgeol, EurGeol, FGS

Director & Principal Engineer at Cimmeria Consulting

Engineering Geologist with an extensive career spanning over twenty years in the field of Geotechnical Engineering and Geological Engineering Consultancy. He boasts a solid academic background, demonstrated by his bachelor's degree (5-year degree) and master's in Science, in addition to being a Chartered Geologist (Cgeol), European Geologist (EurGeol), and Fellow of the Geological Society (FGS). His expertise is endorsed by his status as a Professional Geological Engineer, highlighting his commitment and excellence in the profession.

His career has seen him involved in projects in countries such as Spain, Mexico, Australia, Saudi Arabia, and the United Kingdom, Phillipines among others. Specialising in terrain modelling, site investigations, and foundation design, Javier combines technical skills with a strategic approach to project management and risk assessment.

As the director of Cimmeria Consulting, he leads with a focus on innovative and effective solutions, ensuring the sustainability and success of projects. His leadership is marked by the integration of technical excellence and efficient management, fundamental to the growth and global recognition of Cimmeria Consulting.



Santiago Ortíz
Dir. en Ingiter



Javier Carmona
Dir. en Cimmeria



Eduardo Sendín
Dir. en ES Calculations



Víctor López
Ing. en Ingiter

Eng. Eduardo Sendín Moreno

Director & Principal Engineer at ES Calculations

Graduated from the Polytechnic University of Madrid with a degree in Civil Engineering and a master's in structural engineering, he has fostered a distinguished career in global engineering with professional stints abroad, accumulating extensive experience in international projects of various kinds.

Specialised in the design of complex structures and support during the construction phase, he has led flagship projects, from skyscrapers to critical infrastructures.

As the director of ES Calculations, he has expanded the firm into new markets in the Asia-Pacific region, where his leadership has strengthened the company's presence in large-scale projects. Recognised for his operational excellence and strategic vision, he continues to drive the forefront of structural and geotechnical engineering, with a firm commitment to mentoring and professional development within his team.



Santiago Ortíz
Dir. en Ingiter



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Dir. en Cimmería



Eduardo Sendín
Dir. en ES Calculations



Víctor López
Ing. en Ingiter

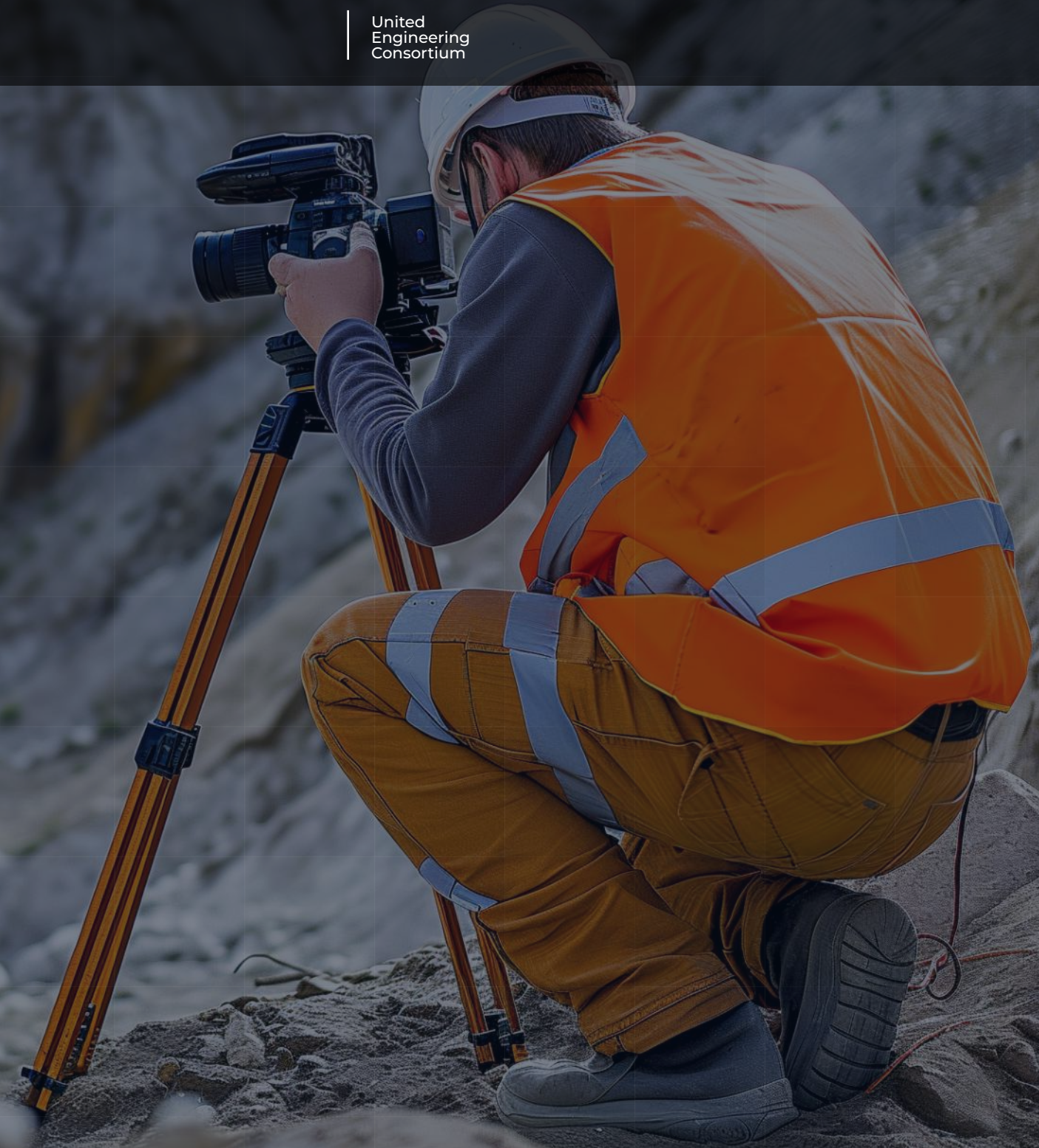
Eng. Victor López Ausín

Manager & Project Lead Engineer

Victor López Ausín, with a consolidated career at INGITER since December 2009 and notable experience in the academic field as an Associate Professor at the University of Burgos, is a Civil Engineer specialised in Hydraulics and Environmental Engineering. His professional approach spans from project management and execution to teaching and research, representing a vital link between engineering theory and practice.

At INGITER, Victor has excelled as a manager and lead engineer, spearheading geophysical studies and projects with a deep focus on subsurface characterisation and stability analysis, applied across a broad range of infrastructures, including wind farms and maritime works. His international experience, stretching across Latin America and Africa, reflects his ability to adapt and apply his knowledge in various geographical and cultural contexts.

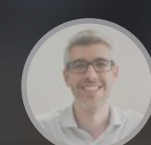
As an academic, Victor has contributed to the University of Burgos not only with his technical expertise, teaching subjects like Maritime Engineering and Maritime Works, but also with his research experience, especially in the study of the energy performance of dynamic penetration tests.



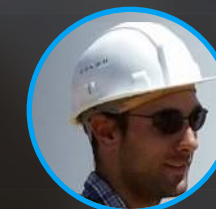
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Victor López
Ing. en Ingiter

Contact

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