



Member of the Surbana Jurong Group



Annual Review

2021

We're redefining exceptional

Through our specialist expertise, we're challenging boundaries to deliver advanced infrastructure solutions.



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Interview with the CEO

How would you summarise SMEC's performance in 2021?

As a result of governments and institutions accelerating investment into 'essential infrastructure' SMEC achieved our best year ever. Most of our sectors experienced growth, and we continue to see increasing demand for infrastructure services globally.

2021 was a huge achievement, which reflects the passion and the resilience of our people. In the adversity of the pandemic, we provided technical assurance to some of the world's most complex infrastructure challenges. I thank all our team for their efforts.

Many of the projects featured in this review have reaped the benefits of a global, collaborative delivery model. Across our core sectors, especially transport, sustainable energy, urban development, and water, we are adding value for our clients right across the project lifecycle.

How has SMEC evolved through the pandemic and what were the main impacts?

Throughout all the disruption, technology has enabled us to stay connected and deliver work remotely. As a result, we have shaped a more agile way of working that affords many of us more flexibility.

Different regions have had to adjust to different restrictions, so our approach to operational resilience has varied from country to country. Generally, the contract award and mobilisation process slowed. In some of the harder hit regions, projects were paused as organisations grappled with a complete restructuring of their operations.

The pandemic had taught us a lot of lessons about how to adapt to the changing world we live in. The work environment has been completely reimaged, so we are continually looking at ways to ensure our people feel supported and engaged. Further enhancing a workplace culture in which people can build a connection with their colleagues and our values remains as important as ever.

What are some of the key focus areas for SMEC looking ahead to 2022?

Sustainability and technology will underpin everything we do. Clients are mandating carbon neutral solutions and alignment with the UN Sustainable Development Goals. Across the world we have noted a shift in environmental and social consciousness. There is increasing focus on sustainable energy production, energy efficiency and lifecycle costs. As engineering professionals, we are in a privileged position, to influence societies environmental footprint by advocating more sustainable solutions to our clients and partners.

In 2021 we have further embraced digital transformation. Innovation and integration of new technology is enabling more efficient project delivery. These efficiencies are adding value to business cases, design documentation, and construction - as well as operations and maintenance aspects. Within SMEC and across the broader Surbana Jurong Group, we are continually enhancing our capability to deliver fully integrated solutions.

"As engineering professionals, we are in a privileged position, to influence societies environmental footprint by advocating more sustainable solutions to our clients and partners."

Hari Poologasundram
CEO SMEC & CEO International Surbana Jurong

How does SMEC's 70-year legacy impact our values and behaviours today?

I believe our values are encapsulated by a can-do attitude and our people have always endeavoured to give back. By investing in the SMEC Foundation we continue to support programs that help to change the lives of communities. At the same time, we have established a legacy of training local people, enabling them to develop new skills and pursue professional careers.

Tracing back to the original Snowy Mountains Hydroelectric Scheme, our legacy echoes a unique, once in a generation project that brought together engineers from over 30 different countries. This multicultural, highly collaborative model is embedded in our DNA. Bringing people together from different backgrounds, SMEC continues to aid the creation of essential infrastructure right across the developing world.

We are very proud to work on international development projects. We provide communities with access to resources that many of us take for granted. As an organisation our leadership carries the responsibility to continue our legacy of nation building projects.

How is SMEC positioning for the future?

Like many of our counterparts, a big challenge for the future is finding the right resources to support projected growth. At SMEC we are working hard to become a global employer of choice, and are taking a global approach to resource optimisation and delivery.

We recognise that there are opportunities to share work across different time zones and expand our delivery capacity. Through our global centres of excellence, we are leveraging a brains trust of world class expertise to share best practice technical solutions and lessons learned.

As part of the Surbana Jurong Group we are seeing increasing opportunities to partner with our family of brands to provide our clients with access to world class expertise across infrastructure, architecture, and urban planning. In this sense, SMEC is taking a more strategic approach to ensure we play to our unique value proposition.

A family of specialists



As a member of the Surbana Jurong Group, SMEC is part of a family of specialists. We align specialist expertise to deliver effective, practical and sustainable outcomes.

Leveraging our 70-year history of delivering nation-building infrastructure, we provide technical expertise and advanced engineering services to resolve complex challenges.

Our core infrastructure sectors include Roads & Highways, Rail, Metro and Transport Orientated Development (TOD), Aviation, Hydropower & Dams and Renewable Energy. Other key markets include Urban Communities, Water, Environment, Ports & Maritime and Managed Services.

We frequently collaborate with our parent and sister companies enabling us to add further value for our clients. Through our network of global specialists collaborating with local partners, we connect clients with the right blend of skills and experience to deliver innovative and sustainable solutions.

Our values

Our values define our culture and underpin everything we do, globally.

Integrity, People, Professionalism, Partnership and Purpose represent what we stand for, what we expect from our people, what we deliver to our clients, and how we aim to conduct our daily work.

Integrity

We act responsibly and conduct our business with the highest ethical standards, accountability, and transparency.

People

We value our global and diverse talent by creating a safe, inclusive, and supportive environment where our people can thrive.

Professionalism

We act in the best interests of our clients and deliver innovative solutions with high standards of excellence.

Partnership

We build trusted and enduring relationships with clients, partners, and colleagues to achieve win-win outcomes.

Purpose

We are passionate and committed to making meaningful impacts on people, environment, and communities.



Enabling our people

SMEC employs over 5,400 people in over 35 countries around the world, supported by a globally integrated People & Culture team, which diligently supports our key business objective to be an employer of choice.

We are committed to creating a rewarding, inclusive workplace for our people by encouraging personal and professional development, recognising good performance, fostering equal opportunities, and ensuring employee health, safety, and wellbeing.



Engagement and development

Our people are at the core of who we are and what we accomplish. Results of our global annual engagement survey indicated a higher-than-average engagement score and participation rate across the SJ Group. At SMEC we have adopted a localised approach to engaging with our people. Regional leaders are consistently and regularly communicating through a structured program that utilises a range of communication methods, information sharing platforms and channels.

In ANZ, we continued our Cultivate program which provides targeted development opportunities for high-performing female employees. We also continued our support for the 'champions of change' coalition and retained our accreditation with the Workplace Gender Equality Agency.

Leadership diversity

SMEC is committed to promoting gender diversity, establishing an inclusive working environment, and promoting female participation in engineering through active industry representation and participation. A key achievement in 2021 was the appointment of Kate Drews, Market Director, Urban Communities to the ANZ Board, bringing female representation to the board. Also in ANZ we continued our support for the 'champions of change' coalition and retained our accreditation with the Workplace Gender Equality Agency.

Two key members of the ASEAN Divisional Management Committee are female: Karen Atkinson, DCOO ASEAN, and Libby Paholski, Functional General Manager Environment and Social Development SEA and Pacific. Karen Atkinson was also appointed as a member of SMEC's Executive Committee and Director for the SMEC Foundation.

Client commitment

Our people are dedicated to understanding their clients' needs and proactively responding to project requirements. We understand the value of local relationships to ensure that we develop optimal solutions. Our specialist teams are enabled by data and technology, guided by global and local experts with extensive experience.

Our global Client Relationship Management program is being expanded to improve how we collaborate with clients, stakeholders, and delivery partners. We continue to develop global workshare systems and to increase collaboration and technical assurance. In our core sectors we have developed technical leadership platforms and regional 'centres of excellence' to ensure knowledge is shared across projects.



Giving back to communities

As the world recedes from the COVID-19 pandemic, support for the most vulnerable people and communities is needed more than ever.

At SMEC we're privileged to have the opportunity to positively impact the individuals and communities we work with. Our Corporate Social Responsibility framework reflects our values and how we aim to conduct our daily work, with our three focus areas being People, Community, and Sustainability.

Through the SMEC Foundation we partner with organisations globally to help make a difference. Locally based SMEC teams actively collaborate with charities to implement the projects funded by the Foundation. In 2021, water supply and education for underprivileged and indigenous children were key elements of our programs.

Through the generosity of our donors and SMEC alumni, we continued to progress Alastair McKendrick House, an orphanage in Tanzania, provided clean

drinking water for rural villages in Nepal and improved access to safe water for remote communities in Papua New Guinea. Alastair McKendrick is a former long serving SMEC Director and Group Chief Financial Officer (CFO), who passed away in September 2018, but his legacy lives on through his contribution to the children of Tanzania.

A heartfelt thank you to the donors and volunteers who helped bring these projects to fruition. We will continue to support the challenges faced by communities worldwide, and with the help of our colleagues, charity partners and supporters, provide practical support to improve the health, quality of life and wellbeing of those most in need.



Albion Park Rail Bypass Project, Australia

Industry recognition and Awards

Building towards a more sustainable future requires a combination of collaboration, expertise, and innovation. Throughout 2021 SMEC's projects and people received awards from multiple national and international advocates of engineering design excellence.

Engineering News Record (ENR)

#24 ENR 2021 Top 225 International Design Firms

12D Innovation Awards

Winner | Customisation

PMR.africa

Winner | Diamond Award 1st Civil Consulting Engineer

Winner | Diamond Award 1st Structural Consulting Engineer

Arogya World

Winner | The Healthy Workplace program

Consulting Engineers South Africa

Winner | Visionary Client of the Year

The Project Management Institute (PMI) Ghana

Winner | Project Management Consultant of the Year

Concrete Institute Awards, Queensland, Australia

Winner | Award of Excellence

Repairs, Restoration & Retrofitting

West Chevron Island Bridge

Queensland Major Contractors Association

Innovation and Excellence Awards, Australia

Winner | Project of the Year under \$100 million,

Binna Burra Remedial Works

Planning Institute of Australia Awards

Commendation | Community Wellbeing & Diversity,

Queanbeyan Civil and Cultural Precinct

Australian Water Awards, Northern Territory

Winner | Young Water Professional, Jocelyn Ellero

AITPM, South Australia

Winner | Young Professional Award, Gayath Chalabi

Consulting Engineers South Africa

Winner | Mentor of the year, Edward Archer

Queensland Major Contractors Association, Australia

Finalist | Design and Innovation, Luggage Point

Australian Landscape Institute Awards

Finalist | APA National Planning + Landscape National

Guidelines

Australian Water Awards, Queensland

Finalist | Young Water Professional, Alice Connell

Engineers Australia, Queensland, Australia

Finalist | Professional Engineer of the Year, Richard Kelly

Engineers Australia, Sydney, Australia

Finalist | Young Professional Engineer of the Year,

Ben Chapman

Engineers Australia, Sydney, Australia

Finalist | Professional Engineer of the Year, Sabrina Kost

National Association of Women in Construction, Queensland, Australia

Finalist | Crystal Vision, Kate Drews

Our projects

Investing in a sustainable future

The following projects reflect the evolving maturity of our portfolio. Propelled by our expanding global capability, SMEC is delivering integrated solutions that impact the full breadth of the project lifecycle.

Transport orientated development continues to be a major source of government investment as well as essential infrastructure services such as renewable energy and clean water. In addition to delivering traditional engineering design services, SMEC is developing our portfolio in front end feasibility and business case analysis, advisory consulting, and lifecycle asset management. These services are knitted together by a global network of environmental, geological, and social development experts.

The following section highlights some of our key projects and milestones across Africa, Central and South Asia, the Association of Southeast Asian Nations and the Pacific Islands, the Americas and Australia and New Zealand.





Lesotho Highlands Water Project, Kingdom of Lesotho

Double breakthrough for Polihali Dam Diversion Tunnel

The Lesotho Highlands Water Project (LHWP) comprises a system of several large dams and tunnels throughout Lesotho, which delivers water to the Gauteng region of South Africa via the Vaal River System. It is the largest water transfer scheme in Africa.

Lesotho Highlands Water Project Phase 2

SMEC South Africa is a member of the Metsi a Senqu-Khubelu Consultants Joint Venture, appointed to design the tunnels for Phase II and lead construction supervision. Phase II will increase the current water transfer rate of 780 million cubic metres per annum incrementally to more than 1,270 million cubic metres per annum. At the same time, the quantity of electricity generated at the Muela hydropower station will exceed 500GWh per year and is a further step in the process of securing an independent electricity source to meet Lesotho's domestic requirements.

Polihali Dam

In August 2021, Lesotho Highlands Development Authority (LHDA) celebrated a significant milestone in the construction of Phase II of LHWP with the double breakthrough of the projects two diversion tunnels. The breakthrough marked the completion of 1,870m of tunnel excavation. The 7m and 9m diameter tunnels were excavated by both drill and blast method and achieved the breakthrough on the same day.

The diversion tunnels will enable dry zones for the construction of the Polihali Dam, to ensure the site is uninterrupted by the river flow. The construction methodology

incorporated concrete intake structures and a range of concrete lining methods. The team used shotcrete, in-situ reinforced concrete and invert concrete lining to optimise the process. The delivery team overcame challenges such as the COVID-19 pandemic, harsh weather conditions and flooding of the Senqu River which affected the construction site in January 2021.

Katse Dam

SMEC is also working on the Polihali Transfer Tunnel contract, which involves the design and construction supervision of the 38km long water transfer tunnel from the planned Polihali Dam to the existing Katse Dam. The tunnel is to be largely excavated by tunnel boring machine but also includes significant lengths of drill and blast tunnelling. The scope incorporates two gate shafts which will be used to manage future operations. Each gate shaft will include stoplogs, gates, dewatering pumps and filling valves. A notable technical feature of the project is the Katse lake tap, where the tunnel is designed to be excavated into a dam basin below water level. Construction of the 38km section of tunnel is expected to commence mid-2022.

1,870_m
of tunnel excavation

1,270_{million}
cubic metres per annum

500_{GWh}
per year

Karot Hydropower project, Pakistan

\$2bn 720MW Karot Hydropower project approaches completion after six years

Powered by the Jhelum River, Karot Hydropower plant will generate 3.2 billion kilowatt-hours of electricity each year, meeting the energy demand of five million people. It will also reduce 3.5 million metric tons of carbon emissions annually and save around 1.4 million tons of standard coal equivalent each year.

SMEC has worked on the project since its inception, initially undertaking feasibility studies for the site in 2009. Then in 2016, the SMEC-SIDRI-SECEC-Joint Venture was appointed by Karot Power Company Limited as Employer's Engineer, undertaking design review and overseeing construction supervision. SMEC oversaw all aspects of construction management, acting as the main interface between the contractor and client.

Karot Dam is the first Asphaltic Concrete Core Rockfill Dam in Pakistan and the first renewable energy project constructed under the China Pakistan Economic Corridor. SMEC has provided a world class team with detailed knowledge of international building standards for hydropower facilities. As part of the scope, SMEC also undertook detailed analysis of the proposed design. To reduce risk, SMEC made several amendments to the

dam's design and construction methodology. By providing ongoing training and mentoring to the client team and building contractors, SMEC has added value throughout the construction phase.

The dam is 95.5m high, 460m wide and 461m above sea level. New infrastructure at the facility includes three major bridges and 9km of roads, relocated to the Reservoir Area. The reservoir stretches approximately 27km upstream of the dam and features a capacity of 152 million cubic metres at full supply level. The surface powerhouse includes four turbines (180MW each). The project also includes four 316m long headrace tunnels, a spillway, three 447m long diversion tunnels and cofferdams upstream and downstream of the main dam. The plant will be interconnected to the national grid by means of a 5km-long, 500kV transmission line.

3.2Bn KW
per annum

3.5million
metric tons of carbon saved

5km Kv
transmission cable



Kameng Hydropower station, India

Harnessing 600MW of hydropower from the Bichom and Tenga Rivers in the Himalayas



Kameng Hydropower Station commenced commercial operation in February 2021. SMEC delivered engineering design services, construction supervision and contract administration. During the construction phase, SMEC undertook extensive layout optimisation to ensure the design was built in accordance with international best practice. Two dams (Bichom 69m and Tenga 25m in height) divert water from the Kameng River to a new powerhouse facility, through an 18km water conductor system.

International expertise and lasting socio-economic impacts

Approximately 70 international engineers were deployed to work alongside their Indian counterparts. Leveraging world class dam, tunneling and hydraulic expertise the team worked in close collaboration to overcome fragile ground conditions and ensure the seamless integration of each different component. SMEC rigorously tested the design, using the latest software to accurately model transient flow for the entire water conductor system.

Kameng HydroPower Station provides 13 percent of its generated power for free, supplying 72MW to the State and 6MW for local area development. The dam's legacy delivers a clean reliable source of fuel, new skilled employment opportunities and improvement of rural road infrastructure.

Thwake Multipurpose Water Development project, Kenya

Nation defining water project to supply renewable energy and tackle water insecurity

Thwake multipurpose water development is a priority project in the Government of Kenya's Vision 2030 strategy. It is the largest water conservation and hydropower project ever to be undertaken by the government of Kenya. The works will combine a new dam reservoir and hydropower facility with enhanced water supply and irrigation that will impact 1.3 million people.

Currently under construction, SMEC is leading the design and engineering of the dam, spillway, and powerhouse. SMEC is also undertaking investigations and developing designs for two new water treatment facilities and sanitation infrastructure for the projects later phases.

Integrated design and management

As part of the dam design, SMEC has delivered advanced hydraulic modelling to test and optimize flow rates across the 422km distribution network. The team also developed a miniature physical model of the site area to clearly articulate the interfacing components of the dam's infrastructure.

Sedimentation of the dam was a major problem which was overcome using sediment modelling. Based on SMEC's recommendations, a multi-agency government committee has been established to spearhead catchment protection and prevent buildup of sediment. This includes upgrading sewerage infrastructure in Nairobi City to control pollution to Athi River.

Late in December 2021, engineers successfully managed to divert the Athi river into the dam's two mega tunnels, marking a significant milestone in the project's implementation.

668
mega cubic m
water storage capacity

40,000ha
of irrigated land

20MW
of electricity to the national grid



Nenggiri Hydroelectric Dam, Malaysia

Preliminary works set to commence on 300MW Hydroelectric Dam

The Nenggiri Hydroelectric project will enhance energy security for Malaysia and bring positive socio-economic impacts for the local communities of Kelantan. The project will support rising energy demand across Malaysia and help increase Tenaga Nasional Berhad's share of renewable energy to 40 percent by 2035. Having passed all environmental compliance and planning protocols, the project's preliminary works are set to commence.



Proposed design solution

SMEC was engaged by Tenaga Nasional Berhad (TNB) in July 2016 to provide engineering services including tender design, detailed design, assistance with tender evaluation, project management, supervision of construction, and commissioning. Having partnered with TNB to deliver the Ulu Jelai Hydroelectric Scheme in Malaysia's State of Pahang, SMEC has a proven track record in delivering complex hydroelectric projects in the region.

Two turbines, the main dam, a saddle dam and a re-regulating dam will provide 300MW of sustainable energy supply. The commercial success of the project is dependent upon controlling the leakage through the saddle dam's limestone foundations. The saddle dam requires extensive grouting works to seal potential leakage paths beneath the dam. The design solution required a comprehensive site investigation, followed

by an integrated design to infill voids and block leakage paths through the limestone.

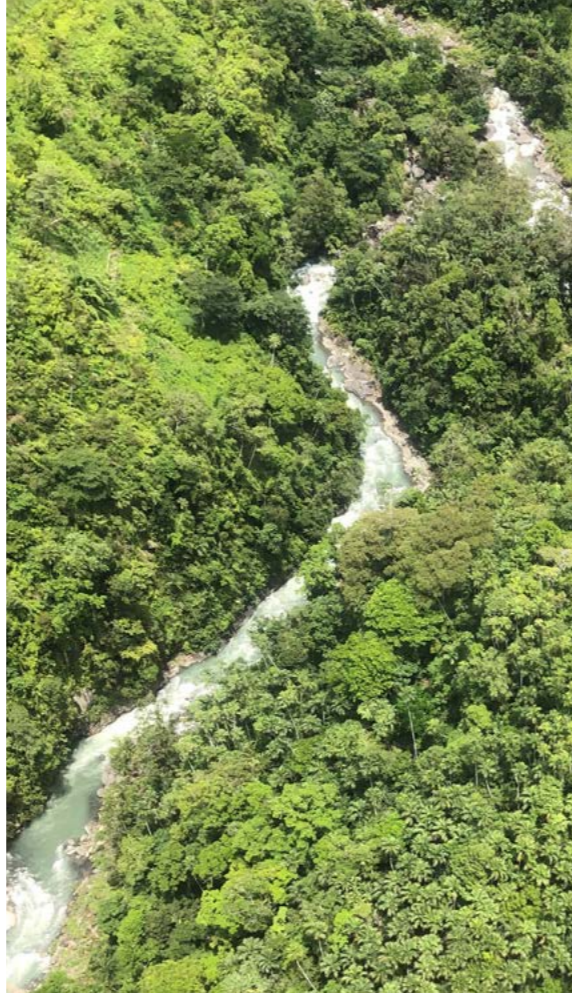
The re-regulating dam has four radial gates that will regulate the large out flow from the main powerhouse. This allows the project to be optimised to generate valuable peaking energy without impacting the downstream community by releasing large flow fluctuations.

Project impact

Once completed, Nenggiri will provide peak load coverage to stabilise the national power grid. Flood mitigation benefits for the downstream areas and the provision of clean water supply are other important outcomes. These will also benefit the downstream economic activities along the river.

Burum Hydropower project, Papua New Guinea

Feasibility investigations at Burum Hydropower continue following client seal of approval



The Finschhafen District Development Authority, AG Energy and SMEC spent 2021 exploring design options for a new hydropower generation facility. The project will leverage the country's untapped hydropower potential and increase the supply of reliable, clean, and cost-effective power in Papua New Guinea (PNG).

Global expertise

SMEC has compiled a world-class team of international experts who have collaborated across offices in PNG, Australia, Nepal and Kuala Lumpur. Together SMEC's engineers undertook due diligence for civil, electrical, and mechanical services, as well as the topographic survey and all geological investigations. SMEC also delivered hydrological and sedimentation studies to determine capacity optimisation.

The project had to overcome several COVID-19 related hurdles during the site investigation works but by utilising locally based staff in Port Moresby, the team was able to conduct all the geotechnical site investigations required for the study.

Outcome and recommendations

The studies enabled SMEC to develop an optimum, financially viable layout option for the development. Salient features include a low height (~6m high) diversion weir, a 3.3km of headrace tunnel, a 34m high underground surge shaft, a 350m long surface penstock pipe, and a surface power station housing two units of Francis Turbines. Other infrastructure includes approx. 7km of new road and approx. 80km of the transmission line from the power station to Lae.

Once developed, it is anticipated that the project will generate 200MW of power, extending rural electrification and replacing diesel generation in the city of Lae and the surrounding region.



Dungowan Dam, Australia

Delivering long-term water security to regional economies

Harnessing a reliable water supply for industry and agriculture is crucial to sustainable economic and population growth. In regional New South Wales (NSW), SMEC has been supporting WaterNSW with the concept and detailed design for a new dam at Dungowan. The proposed 22.5GL earth and rockfill dam will provide greater water security for the regional city of Tamworth, and other townships in the Peel Valley.

As part of the detailed design phase, SMEC has undertaken geotechnical investigations, embankment design, spillway design, outlet works design (structural and hydro mechanical), decommissioning of the existing Dungowan Dam, and ancillary works including road design and utility supplies. SMEC has progressed the design, in line with anticipated program milestones, overcoming restricted access to the regional location, which is approximately 440km north of Sydney.

Following extreme drought events over the past 20 years, bulk water supply security has become a state priority, with the Dungowan Dam declared Critical State Significant Infrastructure by the New South Wales State Government. SMEC is pleased to support

the delivery of Dungowan Dam which will contribute to building water resilience and security in an increasingly challenging environment. For rural communities, projects like this are vital in providing security and reliability of water supply, contributing to economic growth.

“Over the past year working on Dungowan Dam, we have developed a deep understanding what makes this project unique and interesting. All of these previous learnings will be a great asset as we progress to the next phase of the project.”

Jonathon Reid – Chief Technical Principal, and Embankment Design Lead (SMEC).

Sun Cable's Australia-Asia PowerLink, Australia and Singapore

SMEC joins global team of experts in world first renewable energy project

The Australia-Asia PowerLink (AAPowerLink) will be one of the largest renewable energy projects in the world. Harnessing solar energy from Australia's Northern Territory, the project will store and deliver competitively priced renewable electricity into Darwin and Singapore. The project, led by Sun Cable, aims to provide 3.2 gigawatts of dispatchable electricity and could power up to 15 percent of Singapore's electricity needs from 2028.

SMEC, alongside Bechtel, Hatch, Marsh, and PwC Australia, has been appointed as a member of the world-leading integrated project delivery team. SMEC is a key technical partner and, with support of our parent company Surbana Jurong, will be harnessing our solar and renewables expertise and innovation to deliver a project of this size, scale and importance. The power will come from one of the world's largest solar farms, covering 12,000ha at Powell Creek Station, approximately 800km south of Darwin.

Creation, storage and transmission of solar energy at an unparalleled scale

The team will integrate a range of technologies and infrastructure to develop one of the world's largest solar farms (17-20GWp); the world's largest battery (36-42GWh); and the world's longest undersea High Voltage Direct Current (HVDC) cable system

from Darwin to Singapore (approx 4,200km). Key components of the project include:

- A solar farm precinct including energy storage
- High voltage direct current (HVDC) overhead transmission line (OHTL) from the solar farm to Darwin
- Voltage Source Converters (VSC) and a utility-scale battery in Darwin
- A subsea HVDC cable system from Darwin to Singapore
- A VSC and utility-scale battery in Singapore.

The project is expected to begin construction from late 2023, with first supply of electricity to Darwin in 2026 and first electricity to Singapore in 2027 (full capacity by end of 2028).



"The Australia-Asia PowerLink will be the world's largest solar energy infrastructure network and will be a game-changer for the renewable energy sector worldwide. SMEC is excited to be a critical force in bringing this project to life, harnessing our solar and renewables expertise to deliver a project of this size, scale and importance."

James Phillis
CEO, SMEC Australia and New Zealand

San Vicente Energy Strategy, Philippines

A sustainable tourism model to drive inclusive economic growth across remote areas

The Tourism Infrastructure and Enterprise Zone Authority (TIEZA) is tasked with the development and implementation of tourism infrastructure projects across the Philippines. TIEZA has designated San Vicente, Palawan as one of its Flagship Tourism Enterprise Zones. San Vicente's attractions include the longest white-sand beach in the Philippines, so conservation has been an important consideration in developing the business case.

The carefully master-planned site will be funded under a public-private partnership and will deliver a sustainable infrastructure model for the next generation of residents and visitors. SMEC led an extensive feasibility study to determine appropriate power generation and distribution systems which will be critical in the area's development. The study provided solutions to address present power supply shortages, alongside the power requirements of future generations.

Recommendations

TIEZA commissioned SMEC to assess the energy options for the municipality to guide the project master plan and inform the development and construction of new power infrastructure that will underpin the government's tourism strategy. As part of the study, SMEC undertook extensive consultation with key

stakeholders and the community to inform our recommendations. With the aid of detailed survey analysis, SMEC identified four distinct mini grid power systems. The clusters incorporate a mix of renewable energy solutions including solar, hydro, and solar/diesel hybrid systems. Having strategic access to sustainable power and energy utilities is essential to stimulating socio-economic development in the area. SMEC has also provided technical services to enable rural electrification that will benefit San Vicente's 33,000 residents, a significant percentage of whom still have no access to electricity.

SMEC in conjunction with the Public Private Partnership (PPP) Center has assisted TIEZA prepare the bid and transaction documents and rural electrification service delivery model for remote and missionary areas.



New England Solar Farm, Australia

Solar power to supply the equivalent of 250,000 homes per year



Expanding Australia's solar capability

Located across two solar fields near Uralla in New South Wales, the 720-megawatt solar farm is set to become one of the biggest solar photovoltaic power generation projects in Australia. It's being developed by leading renewable energy developer UPC\AC Renewables Australia and will be built in the New England Renewable Energy Zone, which has been selected to host the development of up to 8,000MW of renewable generation capacity. Once constructed, the project is expected to produce 1,800,000 megawatt-hours of clean, renewable electricity each year; enough to power more than 250,000 typical homes in New South Wales.

The New England Renewable Energy Zone is part of the NSW state government's AUD \$79 million plan to deliver new energy infrastructure to lower electricity costs, create jobs and ensure the region becomes a key area for renewable energy investment.

Integrated renewable energy solutions

New England Solar Farm is being built in two stages by Green Light Contractors. Stage one will comprise the initial 400MW solar farm and a 33/330 kilovolt substation to connect to Transgrid's network. SMEC completed geotechnical investigations, feasibility studies and pile design in 2020 and was subsequently engaged to develop the concept through to detailed design in 2021. The scope included early works and technical support across geotechnical, environmental, civil, structural, and electrical disciplines. SMEC is highly experienced in delivering geotechnical investigations and pile design works for renewable energy projects, having delivered more than 80 such projects over the past three years.

Distribution masterplan study, Tanzania

National Tanzanian power distribution study informs 25-year investment strategy



SMEC has successfully delivered a Distribution Master Plan Study for the Government of Tanzania which delivers detailed power system modelling and analysis across four major cities. SMEC collaborated with the Tanzania Electric Supply Company Ltd (TANESCO), on this national strategy to expand electrification and phase out the use of wood fuel as a source of energy.

The four subject regions (Dodoma, Mwanza, Arusha and Mbeya) have an estimated population of around 10 million people. Across the electrical network, line losses, low voltage and power trips are commonplace, but due to a lack of data it was difficult to isolate root cause.

As part of the study, SMEC wrote an electrical distribution planning manual, providing TANESCO with detailed analysis of the distribution network. SMEC also developed concepts for an integrated high voltage transmission network, to increase system supply and reliability. The project will provide grid power to small and medium sized industries contributing to community development.

In addition to preparing the master plan and feasibility study, SMEC provided geographic information system (GIS) and training to TANESCO staff to build inhouse capability. All this has enabled the client to make more informed decisions when faced with operational issues, which helps them to strategically plan future network expansion. Moving forward, TANESCO has acquired a road map and the knowledge base to plan and manage the expansion of distribution networks in Tanzania.

TAMCO business hub, Tanzania

Detailed engineering design and cost estimates for TAMCO special economic zone

Over the years, Gatsby Africa has been working to transform key sectors across East Africa, in a quest to build stronger and more inclusive economies. SMEC collaborated with Gatsby Africa and the Tanzania National Development Corporation (NDC) to prepare detailed designs to power a new 96ha industrial estate at Kibaha District, 30km west of Dar es Salaam. To inform the clients strategic planning for the site, the SMEC team also undertook a detailed assessment of the sites water requirements.

The proposed site posed several challenges, namely lack of access to a reliable power source, poor water supply and inadequate water storage. SMEC undertook all necessary surveys and investigations to determine the optimum location for all new

electrical and water infrastructure including provision for planned future upgrades. Harmonious interface between the power and water functions enabled the team to simulate load requirements for the next 35 years.



SANParks, maintenance and recapitalisation management plan, South Africa

Innovative asset management system developed for SANParks Infrastructure Plant operations

With over 6.3 million visitors each year, South African National Parks (SANParks) recognised the need to modernise their asset management solutions. A purpose-built client-centric system was required to help the agency manage all their different assets in a way that was sustainable and scalable.

SMEC was appointed in 2019, to manage the delivery of a Maintenance and Recapitalisation Management Plan. Over a two year period, SMEC managed a rigorous review of SANParks Infrastructure Plant which culminated in the development of a cloud based fixed asset register and fully integrated asset management system.

During the project, SMEC deployed three teams of technical specialists who each spent roughly 2,000 hours on the road to physically visit and inspect various infrastructure assets. This included verification of assets located in the Kruger National Park, one of the largest game reserves in Africa, and occupied by 'the big five', elephant, rhino, buffalo, lion and leopard.

This project required the expertise of Asset Management Engineers, GIS Specialists, Chartered Accountants and Technical Verification Specialists. Combining the nuances of technical and financial data, SMEC developed a highly customised solution which could be formulated into the Maintenance and Recapitalisation Management Plan.

Live data dashboards now provide SANParks with assurance in terms of budget, timing, and planning for all maintenance projects. The outcome enables precise decision-making and greater efficiencies across the agency.

6,525
buildings

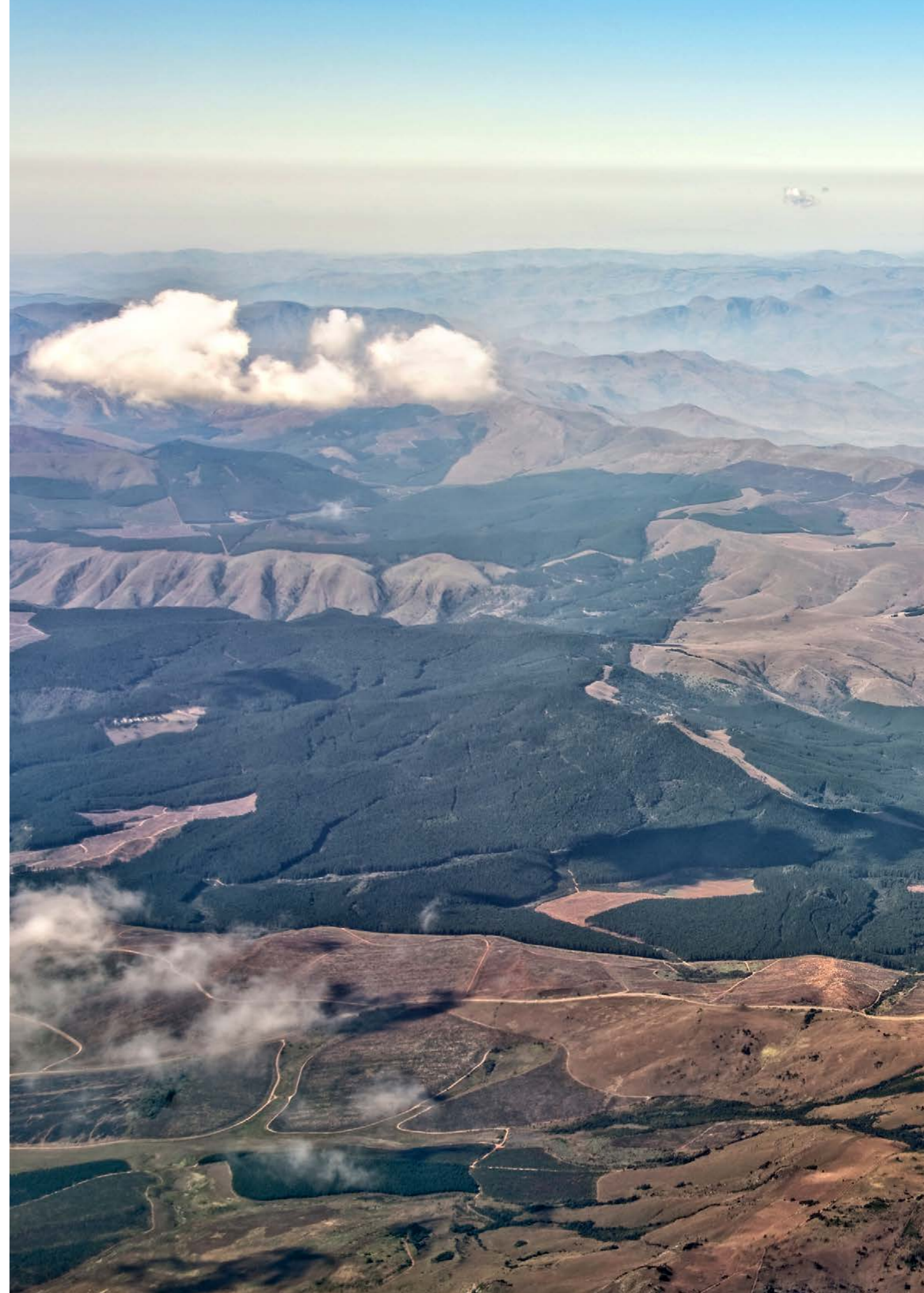
4,560km
of roads

3,256km
of fencing

A world-class system of sustainable national parks reconnecting and inspiring society.

SANParks Vision

As part of the process SMEC's team visited parks to inspect assets, verify their condition and ascertain their value. The assessment process comprised 6,525 buildings, 4,560km of roads, 3,256km of fencing and further verification of sewerage, water, and electricity infrastructure.



Asset management program, Chile

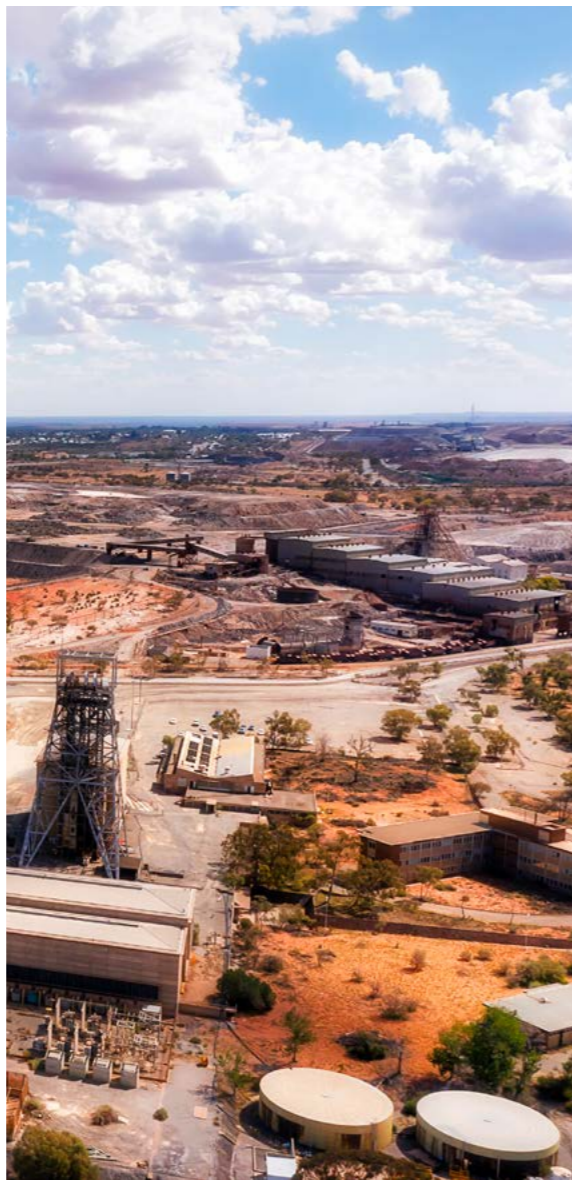
Maintenance and Engineering Center of Excellence thrives

During 2021 SMEC's managed services team became an integral partner to a large copper producer in Chile supporting the Maintenance and Engineering Centre of Excellence (MECoE). Embedded in the Santiago Corporate office, as well as sites across Chile, SMEC undertook extensive asset management operations, helping the client to hone strategy development, processing workflows and management activities.

The MECoE is a dedicated, innovative team focused on developing and implementing the highest standards in maintenance. In collaboration with SMEC the MECoE team deliver a range of specialised management consulting services which extend to strategic planning, procurement, contract management, development, and implementation of non-process Infrastructure, crushing and conveying, and concentrate handling operations. With a focus on equipment performance, the agile team works collaboratively across different time zones to deliver globally integrated solutions.

Leveraging best practice technology solutions, SMEC has helped to redefine the way the client executes maintenance operations in Chile. This equated to 100% completion of MECoE related projects, meeting all KPIs in relation to time and costs. Performance was maintained during the COVID-19 lockdown periods, where SMEC assisted key stakeholders to overcome widespread disruption. At the same time the SMEC team supported the roll out of all COVID-19 related health and safety protocols and reporting measures.

Diversity was a key strength of the SMEC's team which comprised over 40 consultants and targeting a 50:50 male female ratio. This diversity, combined with depth of experience across the key maintenance functions, enabled the team to deliver high performance results for the largest copper producer in the world.



Western Cape abnormal loads project, South Africa

SMEC team launches South Africa's first web-based permit system for abnormal loads

The Western Cape Government, Department of Transport and Public Works identified the need to develop a digital platform which would support the administration unit with processing abnormal vehicle load permits. SMEC collaborated with Aspire Solutions to develop a new web-based application portal, which was launched in 2021. The new abnormal vehicle load permit system streamlines the application process whilst significantly reducing processing times and associated costs.

Customised Solutions

The bespoke system enables the department to quickly evaluate applications and instantly provides applicants with a risk assessment e.g. high risk or low risk. The team has developed a user-friendly document upload system so hauliers can easily submit supporting documentation. The system is supported by customised workflows which enables prompt technical evaluation by the SMEC engineers, the City of Cape Town and the National Roads Agency. If an application is low

risk, the application will bypass the review process and the permit can be granted immediately. SMEC assessed and managed the coordination of all standard specifications and regulation documents. These were then programmed into the web-based system to automate the different workflows.

A notable feature of the system is the expansive crane library, a common abnormal load object, which helps to automate crane application details. The team also developed a routing module that identifies various pinch points such as height, mass, or geometric constraints across the Western Cape. These bespoke features enable the client to utilise data for future operational planning and analysis.

The product is fully operational and initial feedback has been positive. SMEC continues to be involved with system monitoring, which includes training applicants to use the online portal as well as providing training to the client team to build inhouse evaluation capacity.

Transport Connectivity project, Georgia

Roads department of Georgia to leverage a new asset management model

Through targeted interventions, the European Investment Bank (EIB) is extending the Trans-European Transport Network through Georgia, enhancing vital trade and transport links. The Ministry of Regional Development and Infrastructure (Roads Department) initially appointed SMEC as the program's technical advisor. SMEC identified an opportunity to optimise operations.

Following consultation, the team recommended that the client explore using an integrated project management information system (PMIS). SMEC subsequently led development of an online management tool for all EIB funded infrastructure projects in the country.

Developed for the Roads Department of Georgia, the online platform is a bespoke solution that enables the asset owner to manage tasks remotely. It enables the team to manage tender documents, task distribution, stakeholder communications, Gantt charts and other project management tools. The platform also collects live project information to improve reporting and monitoring. SMEC has consolidated and harmonised data for eight projects under EIB financing, coordinating input from various stakeholders including the client, contractors, consultants, and ministry.

The provision of ongoing technical assistance provided by SMEC is helping to lay the groundwork for new and safer roads to be built throughout Georgia in the years to come.

Sydney Metro City and Southwest, Australia

Major stage of Australia's largest metro rail project reaches completion

Sydney Metro is the first fully automated metro network and arguably the most transformative rail infrastructure project in Australia's history. SMEC is proud to have provided technical expertise across multiple sections of the project, which celebrated the construction completion of Sydney Metro City and Southwest Tunnels and Stations Excavation (TSE) project in late 2021. The new metro will vastly improve connectivity across metropolitan Sydney, leaving a legacy for generations to come.

Complex excavation works unlock tunnels for new metro stations

SMEC was engaged in partnership with APP to provide Independent Certification (IC) services for the project which extends the metro rail under Sydney Harbour. SMEC was responsible for certifying the design and construction of tunnels and station excavation works in accordance with the IC Deed. SMEC's expertise provided assurance to the client team, safely and efficiently managing certification of this complex tunnelling project.

The TSE delivered a 15.5km twin railway tunnel from the Sydney north shore in Chatswood, beneath the harbour and the CBD through to Sydenham in Sydney's inner west. Five purpose-built tunnel boring machines (TBMs) were deployed on the project. A mixed-shield slurry TBM and four double-shield, hard-rock TBMs were specially designed to excavate in the under-harbour ground conditions.

The project scope also delivered excavations and tunnels for new metro stations at Crows Nest, North Sydney, Barangaroo, Martin Place, Pitt Street and Waterloo, and civil works for a new stabling facility at Marrickville. In a separate role, SMEC was also engaged as the Lead Consultant and safety assurance manager for the design of Crows Nest Station, which has delivered outstanding design efficiencies and sustainability outcomes.





Dhaka Metro mass rapid transit system, Bangladesh

Dhaka Metro Mass Rapid Transit System set to alleviate congestion and pollution

Dhaka Mass Transit Company Ltd has set out to introduce a modern public transport system that is fast, safe, reliable, comfortable, and electrically operated. Metro Line 5 (South) is also one of the first underground metro lines proposed for Dhaka. Comprising 16 stations, it will extend the cities mass rapid transit network by approximately 17km.

12.8km
of tunnel and 12 underground stations

4.6km
of elevated viaduct and four elevated stations

In a mega city like Dhaka, reaching consensus on the route alignment required extensive stakeholder engagement to check interfaces with other infrastructure projects. The team has successfully achieved this milestone and is now developing the engineering design. A key focus will be to minimise the impact of severe traffic congestion during construction and mitigate social impacts through resettlement planning. The proposed alignment passes below the famous Hatirjheel lake, adding to the complexity of the tunnel section.

In 2021, SMEC delivered the detailed feasibility study, including the technical feasibility assessment and engineering design framework for every aspect of the project. Once built, the Dhaka metro will drastically change the way public transport is perceived in the country and help in easing out traffic congestion on the road.

Chittagong-Cox's Bazar railway line, Bangladesh

Improving rail connectivity across the Trans-Asian Railway (TAR) network

Chittagong-Cox's Bazar railway line is a proposed 120km dual-gauge passenger line from Dohazari village in south-east Bangladesh to Cox's Bazar, one of the most popular tourist destinations in the country. Stretching to Gundum on the Myanmar border, the project will form a key section of the TAR. In 2021, SMEC undertook detailed design for the new rail line which will contain 39 bridges, 144 culverts and 183 water crossings. Construction of phase one is well underway.

The new railway will improve socio-economic conditions for people living in the rural areas whilst meeting rising demand for passengers and freight transportation services. Stations will be equipped with relay batteries, generator rooms, sewage and waste management facilities, and energy-saving features such as solar panels. They will also feature separate facilities for women, children, elderly and the disabled.

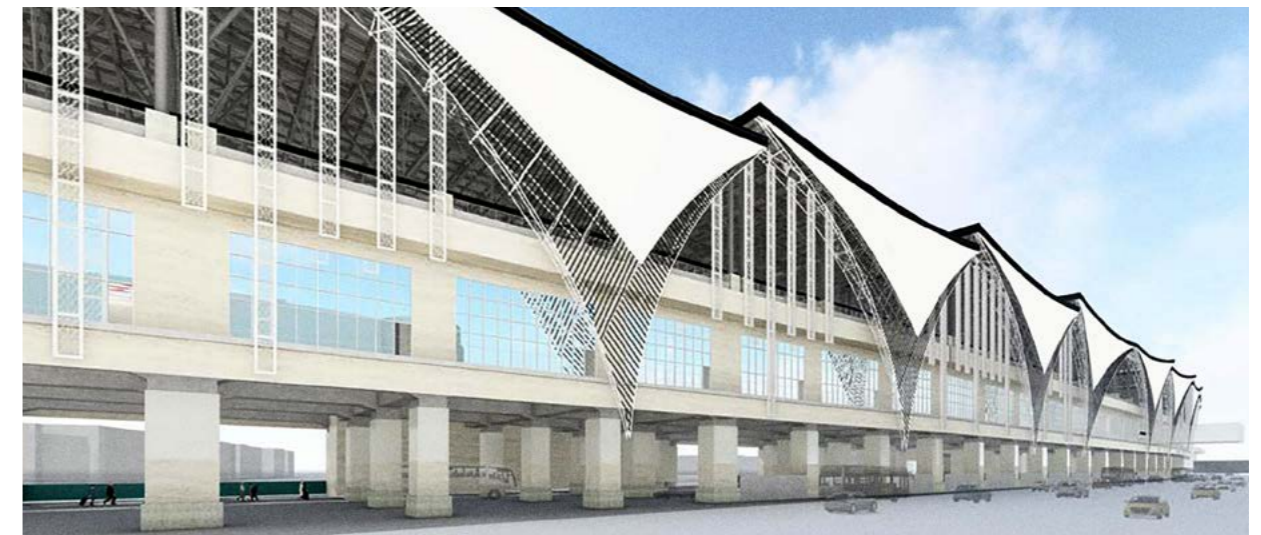
The project proposes Bangladesh's first Elephant crossing. The Asian Elephant is classified as an endangered species and a special investigation along the alignment found 20 crossing areas. Locomotives have also been equipped with thermal imaging cameras which enable drivers to detect the heat signature of an elephant 1,000m ahead.



Mumbai to Ahmedabad high speed rail, India

India's first high speed rail corridor will span 508km across Maharashtra and Gujarat

Connecting the financial hub of Maharashtra to the commercial hub of Gujarat, the Mumbai to Ahmedabad High Speed Rail (MAHSR) will be a catalyst for transport orientated development in the region. Modelled on Japanese 'bullet trains' the service will reach speeds of up to 350kmph and be capable of completing the 508km distance in approximately two hours.



SMEC has been appointed to undertake the design review and verification of architecture, structures and MEP Services (mechanical, electrical, and plumbing). The scope of work includes all temporary works, six new stations, tunneling and depot works. All stations and infrastructure need to be specially engineered to cater to the high-speed movement of the trains.

The finished railway line will feature a 7km under water tunnel, several major bridges and over 450km of elevated track. Elevated viaducts will represent over 90% of the total length of the corridor.

The newly proposed rail stations will incorporate distinct architectural features, capturing the ethos of each city. For example, the concept design for Surat station (known as the diamond city) proposes a diamond

themed façade. Working closely with lead contractor Larsen & Toubro and the National High Speed Rail Corporation, SMEC is tasked with coordinating all design approvals and providing certification in accordance safety, comfort, expandability and sustainability.

At the end of 2021, technical design for all stations and the depot had achieved 75% completion. Construction also commenced on temporary works with final 'good for construction' drawings set to be completed in 2022.

Eastern Cape Province, South Africa

Msikaba Bridge will be the longest and highest single-span cable-stayed bridge in Africa

The Msikaba bridge is a cable-stayed bridge, currently under construction, spanning the Msikaba River, near Lusikisiki in the Eastern Cape Province of South Africa. The bridge forms part of the N2 Wild Coast Road (N2WC) project, which aims to improve the travel time between Durban and East London for light and heavy freight vehicles.

Presidential endorsement

Earmarked as one of the government's strategic infrastructure projects, construction is already proving its worth through the promotion of economic activity, community development, service delivery and job creation at both a regional and provincial level. President Ramaphosa visited the site in September 2021, stating that the project would generate between 21,000 and 28,000 indirect jobs during construction and 8,000 direct full-time jobs once completed.

Temporary work solutions to fast-track construction

The remoteness of the project as well as the logistics of travelling from the northern side to the southern side - a three-hour drive - means that a cable way has been installed as part of the temporary works. A mono-rope cable system, equipped with a six person cabin is being used to transport people and small amounts of material from one side to the other. The cable car takes only eight minutes to traverse the gorge resulting in a significant time saving for all crew on site.

The project has also been aided by an agreement between the South African National Roads Agency

(SANRAL) and the Magwa Tea Estate, the biggest tea estate in the Southern Hemisphere. Magwa has provided 8ha of land for the Engineering teams accommodation camp which houses the majority of SMEC's site staff. This forms part of a legacy project, whereby SANRAL agreed to refurbish existing houses on the estate and provide additional prefabricated houses as part of Magwa's future eco-tourism plans.

SMEC is providing construction monitoring and technical support services for the project which includes short sections of approach roadworks on either side of the bridge, as well as five tributary structures. The composite steel and concrete deck of the main bridge is 22.8m wide and includes foot walks to the outer edges of the deck.

A game changing upgrade to the South Africa Road network

Once complete, the route will be 69km and 85km shorter than the current N2 and R61 routes, respectively, and, owing to its shorter and flatter alignment, between 1.5 to three hours faster for light and heavy freight vehicles.

580m

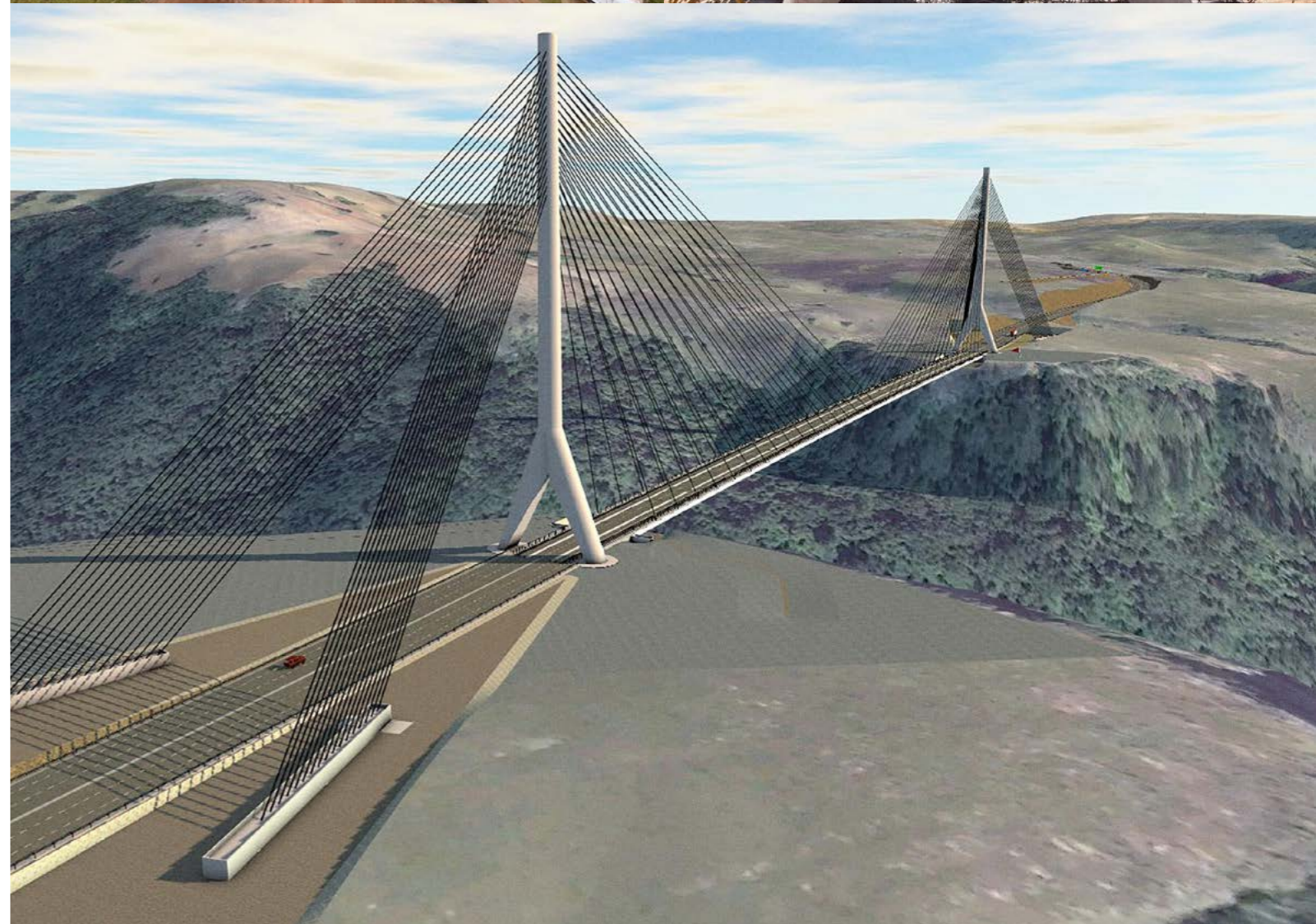
Deck span

192m

high

787,000m³

of earthworks cut





Albion Park Rail Bypass, Australia

Technical design sets benchmark for highway engineering in Australia

The Albion Park Rail Bypass (APRB) provides a 'missing link' between Sydney and Bomaderry, 100km south of Sydney. The new bypass opened ahead of schedule in mid-2021, optimising transit for freight, buses, tourists and commuters travelling to and from the south coast of New South Wales (NSW). Funded by the NSW Government, the \$630 million project incorporates four grade-separated interchanges, 13 bridges, a shared-use pedestrian-cycle path, and local road connections to improve community connectivity.

The APRB was an incredibly complex site, located on a flood plain which features soft, compressible soil and constrained between an airport, railway line and existing highway. In partnership with Fulton Hogan, SMEC implemented a detailed design that addressed the site's complexities through innovation and value engineering. In designing five bridges, three key engineering innovations reduced the total bridge length (across the project) by more than 150m, representing a 30 percent reduction in bridge length from the Reference Design and providing millions of dollars in construction savings to the project.

Innovative solutions overcome unique design challenges

To accommodate the unique skew of the bridge alignments and varied ground conditions, SMEC utilised an innovative pergola-type deck design which included bespoke planks. This was practical and cost effective to construct and maximised span lengths to reduce the number of piers in the floodplain, optimising the efficiency of the bridge from a flooding perspective.

To address issues relating to the building of a large embankment over problematic ground conditions, SMEC worked with Fulton Hogan to optimise the soft soil design. Together, we identified an innovative, unconventional approach using a lightweight fill solution instead of adopting conventional earthworks.

Across the project, our innovation and engineering excellence saved hundreds of hours in design, with significant construction cost saving and completion ahead of schedule. Our specialist teams used technical innovation to set new benchmarks and maintain high standards for Australian engineering. In recognition of the excellence achieved on this project, SMEC's Detailed Design was recognised as the 2020 winner of the Australian Engineering Excellence Award.

Transurban Burnley Tunnel, Australia

Virtual reality sheds new light on driver behaviour

Traffic performance within the Burnley Tunnel located in Melbourne, Victoria, has long been an issue for the community and asset owners, Transurban. Studies identified that flow through the tunnel was below capacity, with drivers reducing speed and causing traffic to compound on the incline exiting the tunnel. This speed variance between the open road, in addition to maintenance and replacement needs, led Transurban to undertake investigations into possible solutions.

To investigate the redesign solutions, SMEC proposed an innovative methodology, utilising a digital model of the Burnley Tunnel in Virtual Reality (VR) to examine potential changes to physical attributes and the impact on driver behaviour. With support from SMEC's subconsultant, Snobal, VR models were developed based on our specialist design advice, enabling the team to gather large data sets from the VR driving rig, such as eye tracking and biometrics to gain a deeper understanding of driver behaviour.

Road design and driver behaviour are intrinsically linked

One of the solutions Transurban is exploring is dynamic 'pacemaker' lighting systems which consists of LED lights on the tunnel walls, which move at the signed speed limit, to regulate traffic flow speed more effectively. Transurban selected some of its customers to participate in a public testing trial of the VR models. Participants virtually drove through the tunnel in its current form and again in a new model which illustrated different lighting, wall coating and the dynamic pacemaker lighting.

This methodology adds significantly more value than a static digital model because it includes a new dimension – it provides a dynamic experience of the asset. This delivers increased value to clients seeking to measure outcomes prior to expensive design stages, which ultimately benefits the users who drive through the tunnel every day. The improvement options tested during the project will be trialled and will inform the performance specifications and detailed design for the solution.



Suva Arterial Road Upgrade, Fiji

Construction commences to upgrade transport infrastructure in Fijian capital

Client vision and overview

Spanning 17km, the Suva arterial road upgrade will transform urban collector roads and arterial roads. The project will reduce safety risks across the transport infrastructure system, including roads, bridges, jetties, and wharves. A key element of the brief was to embed climate resilience into the design.

SMEC compiled an international team of experts from Fiji, Malaysia, Australia and the Philippines. The team is delivering all services associated with road design including alignment, pavements, drainage, electrical, signalling, civil infrastructure, water management and telecommunications.

The primary scope of this project is to reconstruct the road pavements for a 25-year design life in a friendly urban environment. The project is being delivered by the Fiji Roads Authority on behalf of the Government of Fiji in partnership with the World Bank and the Asian Development Bank.

Small innovative solutions were adopted to develop an affordable design that met client expectations. Overhead utilities will be moved underground to provide protection from high winds, along with cycle facilities being introduced to promote alternative transport options. The design incorporates upgrades to support impaired residents and make Suva a more accessible city. The width of the footpaths was extended to 2m wide with access ramps, raised crossings for pedestrians and improved bus stop facilities.

Design works were completed in 2021

The Suva arterial road upgrade has been designed to meet international safety standards and provide a blueprint on how to deliver improved urban infrastructure in Fiji.

Mangapwani multipurpose port, Zanzibar

SMEC completes Environmental Impact Assessment on East Africa / Middle East trade hub

The Mangapwani multipurpose port is a new cargo facility designed to equip Zanzibar with adequate infrastructure to meet the growing demands of trade and cargo passage through the region. The project will involve the construction of berths for liquid bulk goods, containers, fishing vessels, natural gas offshore services and workshop facilities.

SMEC was engaged by Seaport Group BV (Netherlands) to provide consultancy services for the Environmental Impact Assessment and Preliminary Site Surveys. This included topographic and bathymetric surveys and geotechnical investigations of the site. The investigations will form part of the Feasibility Study which will be used by the Oman Investment Authority to inform the next phase of implementation.

With local engineers situated in the region, SMEC was able to mobilise environmental, geotechnical, and marine transport specialists to expedite analysis of the survey information ahead of schedule. The pre-selected location will be based on minimising excavation, capital dredging, quay wall construction, and minimising environmental and social impacts.

The Grove, Australia

11ha of natural wetland habitat enhances local ecology and provides recreation for 1,600 families

The Grove is a unique community that embraces its proximity to the adjacent Werribee River and Davis Creek to create a thriving ecosystem for local bird and frog species, while providing picturesque open space for the local community to enjoy. Located 31km from Melbourne's CBD, The Grove incorporates an intricate wetlands systems and civil infrastructure designed by SMEC's Urban Communities team.

The new wetlands have been designed to meet Melbourne Water's best practice requirements. In addition to providing an attractive outdoor space for the community, the wetlands system will also perform an important water filtration function, helping preserve the health of surrounding waterways.

Integrated Landscape Architecture and Civil Infrastructure solutions

SMEC's Landscape Architecture team together with our Civil Engineering team are responsible for the concept design through to delivery of over 19ha of amenity area, including the wetlands park, waterways, and associated parklands. The landscape architecture scope of work includes the design and delivery of the wetlands park plus streetscapes, bridges, playgrounds, pavilions, and shelters. To

date, the civil engineering scope has included delivery of 970 of the 1600 lots, dual carriageway collector roads, signalised intersections, 11 hectares of wetlands, 2km of waterways and 3km of branch sewers. Also included was the local roads, drainage, water and sewer reticulation and the coordination of gas, electrical and communications services.

SMEC worked with the developer Frasers to seamlessly integrate these significant features into the 167 hectare community. Supporting the master-programming of the project SMEC has ensured each phase has been delivered in a timely manner, mitigating the risk of delay, and ensuring the future program can be accelerated to meet market requirements.



Stellenbosch University decanting facility, South Africa

Stellenbosch decanting facility and Silvertrees parking

The Stellenbosch University facilities management division is tasked with an ambitious upgrade program to oversee the renovation and upgrade of multiple buildings across the campus. Their campus vision is to provide sustainable, accessible, and future-focused facilities and services. Located in the northern quarter of the expansive Stellenbosch campus, the new decanting facility sets a new building typology for the precinct which will help enable the universities long-term development ambitions.



The new building has been developed with sufficient functionality to house various faculties in a modern and agile setting. The facility will provide temporary, but fully functional workspace for engineering students and staff while upgrades to their buildings are completed. Once construction has been completed at the Faculty of Engineering, the decanting building will be used during other campus renewal projects.

SMEC's services included civil engineering, services coordination, planning approvals, layer works design, construction monitoring and contract administration. This included the bulk master planning of the precinct civil infrastructure, the external services for the building and the adjacent parking area. A new parking area services the new decanting building and new student residences alleviating parking congestion on the site.

All parking bays consist of permeable grass blocks filled with crusher stone to ensure the water table is replenished during winter rainfall.

Sustainability was embedded into the design and applied throughout the construction. Sustainable Urban Drainage Systems have been installed which elegantly incorporate stormwater management solutions. Attenuation ponds create a visual feature and recreational amenity. Pedestrian linkages provide safe passage around the site and tactile paving has been incorporated to ensure universal access.

Gabiro Agribusiness Hub, Rwanda

Helping revolutionise local agriculture in Gabiro, Rwanda



Gabiro Agribusiness Hub is situated in a poorly irrigated, semi-arid region with an annual rainfall of only 800mm. By harnessing water from the Akagera River, the Rwanda Development Board aims to set up an agri-hub, with an irrigatable area of 16,000ha.

The remediated land will use innovative irrigation techniques to combine modern agriculture and animal resource husbandry, substantially increasing crop yield and milk production whilst providing employment and food security.

Covering an area of 5,600ha, the Phase 1 works focused on irrigation infrastructure; road networks within the scheme; electrical powerlines; housing for resettled

families; and agriculture and livestock training; and demonstration farms to promote modern techniques and innovative technologies.

In supervising construction of the project, SMEC assessed works for compliance with agreed designs and material quantities, and ensured all the works met quality standards.

Juba City strategic water supply and sanitation project, South Sudan

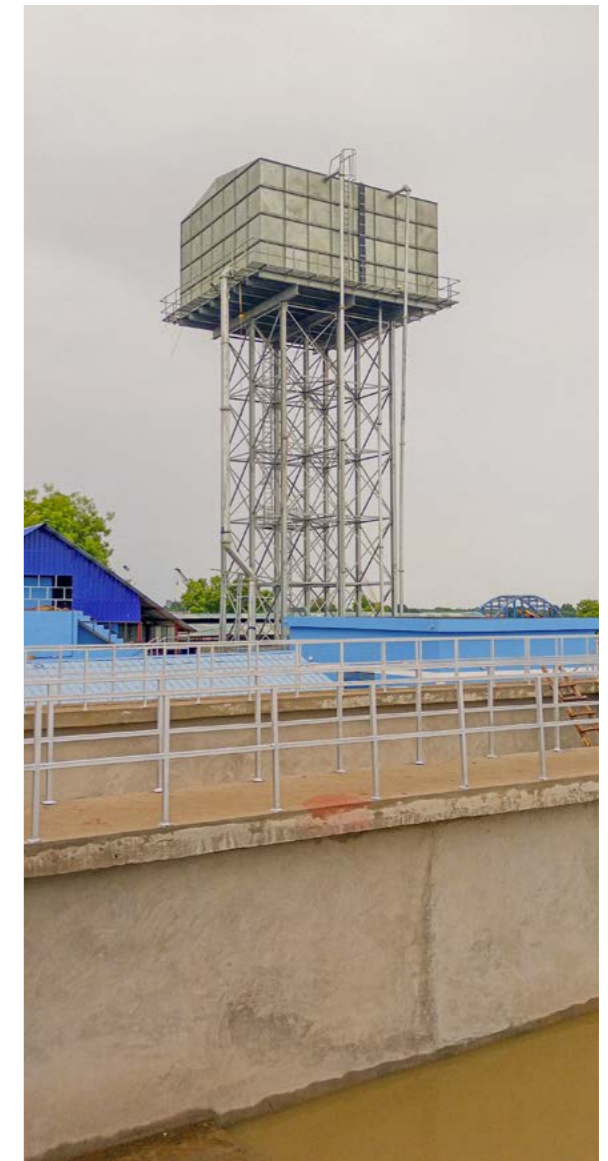
Construction set to commence on 121km water supply network serving 276,000 people

Despite the presence of the White Niles which passes through Juba City, most residents have no access to safe and clean drinking water. The entire population relies on water trucks.

The South Sudan Water corporation received financing from the Africa Development Fund to develop the Strategic Water Supply and Sanitation Project (SWSSIP). SMEC was appointed to undertake feasibility studies, detailed design, tender documentation, and construction supervision to upgrade 121km of water pipework.

The existing water distribution system was fragmented and siloed. Through detailed modelling of the flow systems, SMEC has designed a seamlessly integrated supply network with optimal storage solutions. The entire project was designed on a hydraulic model WaterGEMS therefore network inter dependencies between the existing and proposed systems were easily captured.

Once implemented the project will deliver improved equitable access to sustainable water supply in the project area, improved water system functionality, and improved rural hygiene and sanitation.



Metropolitan sanitation management investment project, Indonesia

Essential sewerage and wastewater treatment infrastructure for Indonesian cities



Indonesia has one of the lowest coverage rates of conventional off-site urban sewerage in Asia. Most cities only have partial sewerage systems with less than five percent of the national urban population connected to central wastewater treatment plants.

The Metropolitan Sanitation Management Investment Project (MSMIP) will respond to the needs of urban communities, including low-income households, by constructing new separate sewerage systems and city scale wastewater treatment plants (WWTPs), setting up local wastewater infrastructure management institutions and strengthening the relevant departments of respective regional governments. The MSMIP will provide improved urban wastewater services in three major cities in Indonesia, namely Jambi, Makassar and Pekanbaru.

Developing an integrated solution

SMEC is working with the Directorate General of Human Settlements to deliver an integrated, sustainable, and regulated sewerage and wastewater infrastructure system. Our team was appointed as the Project Implementation Support Consultant in 2017 with completion anticipated in 2023.

SMEC is collaborating with key stakeholders across central, provincial, and local governments to coordinate the services. This includes project performance

monitoring, technical design, procurement, construction supervision, social development compliance and safeguards compliance.

The project scope includes the construction of approximately 173km of piped infrastructure, 35,300 house connections and three WWTPs with a total installed capacity of 31.7 mega litres per day.

SMEC is also working with stakeholders to develop an institutional framework for the effective operation and maintenance of the facilities and building resources to support the program's long term's sustainability.

Project impact

The outcomes will mitigate contamination of surface and groundwater and the associated spread of water-related diseases and high infant mortality. The MSMIP will provide the first domestic WWTPs in each city's central business district along with a centralised wastewater management system. Funding is financed by the Asian Development Bank, central government and local governments.

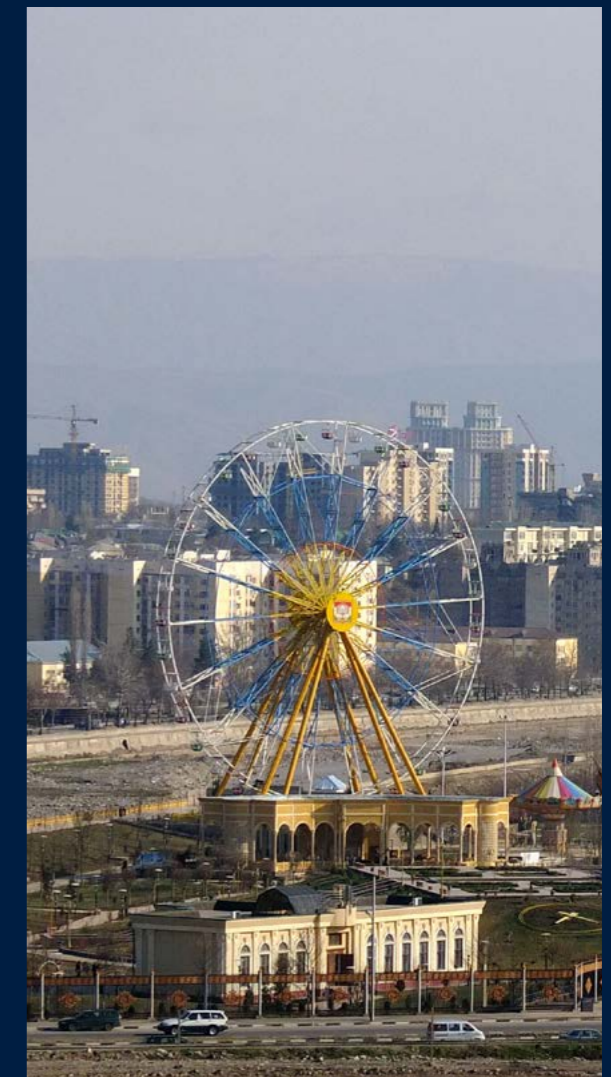
Dunshabe water supply and sanitation project, Tajikistan

A sustainable and climate resilient model for water supply and sanitation

Funded by the Asian Development Bank, the Dushanbe Water Supply and Sanitation project will improve water supply and sanitation for 352,000 people. In recent years Dushanbe has experienced heightened stress on urban infrastructure services. Increased migration coupled with unplanned urban expansion has rendered the city's water and sanitation infrastructure unfit for purpose.

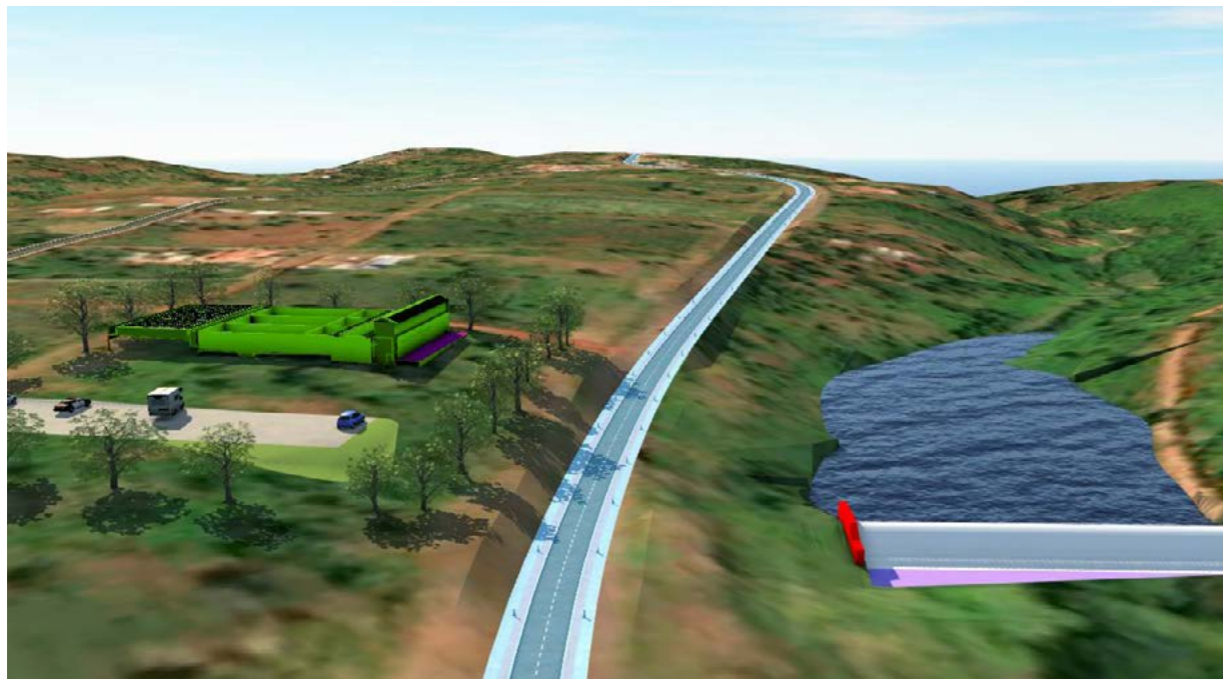
During 2021, SMEC led design reviews for transmission and sewerage pipelines, assisted procurement of suppliers, and undertook construction supervision for key elements of the distribution and sanitation systems. A new network management system with smart water meters will be developed by a local company to ensure efficient water usage. SMEC is supporting the asset owners to build knowledge capacity for future operational management.

Moving forward, SMEC will continue to provide project management, design and technical supervision for the project including rehabilitation of the 9.4km sewer collector, which drains most parts of the Shohmansur district. This will ultimately prevent land and water contamination from raw sewerage and improve sanitary conditions across Dushanbe.



Karimenu water supply project, Thika Country, Kenya

New water intake and treatment facility to augment water supply for 300,000 residents



Located north of Nairobi, water rationing is the norm in Thika's housing estates. Population increase and expanding industrial activity has put stress on the Thika Water and Sewerage Companies ability to meet water demand. Residents have been forced to buy water at exorbitant prices from vendors due to high demand.

The Karimenu Water Supply Project will install a new intake weir and treatment facilities capable of supplying an additional 15,000m³ of water per day. Funded by the World Bank, SMEC was appointed to prepare the Environmental Social Impact Assessments (ESIA), Resettlement Action Plan (RAP) and detailed design works for new infrastructure.

SMEC's Engineering team modelled the water treatment plant in BIM and incorporated open-source hydraulic modelling to simulate existing and future water demand. New wastewater treatment plants will increase wastewater treatment capacity and reduce sewage spillages. A new 25km pipeline will distribute clean reliable water supply across the township.

Dong Ha Song water treatment plant, Vietnam

Dong Ha Song Water Treatment Plant Project



Under co-investment and development by local and international firms, the Dong Ha Song Water Treatment Plant and Water Distribution Project will be the first in the Quang Nam Province to enhance water and sanitation sources for local communities.

The project is expected to be in operation by 2025 and will provide communities, including existing industrial clusters and parks with access to a safe and reliable supply of piped drinking water.

SMEC's project team, including international specialists and locally-based teams in Vietnam, were engaged to support our client with two reports – the Environment and Social Scoping Report and the Feasibility Study Report. Challenges to the collection of survey data were exacerbated by the pandemic situation in Vietnam. Partnering with local consultants, SMEC carried out surveys for some 2,000 households in the area and liaised with local authorities to understand real water demand and study the most feasible options.

Our work has enabled the client to gain an accurate picture of current and projected water demand for both domestic and commercial use. The study has identified means to deliver a plant with the capacity of 50,000m³ per day under a Build-Own-Operate (BOO) scheme. Adhering to international social and environment performance standards, SMEC has supported positive engagement with international financial institutions for the scheme.



Jal Jeevan mission, Rajasthan, India

Har Ghar Nal Se Jal - Water for all

Launched by the Government of India in 2019, Jal Jeevan Mission aims to provide a functional household tap connection to every rural household in the country. Since then, SMEC has been working with governments in Uttar Pradesh, Karnataka, Rajasthan, and Assam to help bring clean water supply to over 15 million people.

During 2021, SMEC helped to set new technical benchmarks, offering cost effective and sustainable solutions that can be easily replicated across different geographical locations. The team has developed designs, including operation and management systems and provided technical management, whilst working within the prescribed specifications, timeline and budget.

Jal Jeevan Mission combines a water sensitive planning approach with the provision of essential infrastructure. The proposed water management model considers the entire water value chain, from supply to disposal. The focus on increasing India's water capacity whilst improving infrastructure, accessibility and consumption monitoring will ensure a sustainable solution for India's water challenges.

The Board

The Board is responsible for formulating SMEC's strategic direction and maintaining good corporate governance. Acting on behalf of shareholders, the Board is accountable for SMEC's financial and operational performance.

The Board is independent of management and has a good balance of skills and experience to ensure transparency and sustained long-term growth.

The Board is committed to maintaining an appropriate system of governance and risk management applicable to all SMEC's locations, business units and functional groups; maintaining the integrity of SMEC's assets, people and reporting, and complying with legal obligations in all jurisdictions in which SMEC operates.

Board Committees

The Board has two permanent committees – the Audit and Risk Committee and the Remuneration and Nominations Committee. Each has written terms of reference and is subject to annual review by the Board.

Audit and Risk Committee

The Audit and Risk Committee assists the Board with financial reporting, managing SMEC's material risks and ensuring that financial information is accurate and timely. The Audit and Risk Committee must have at least three members, and have an independent Chair (who is not the Chair of the Board).

Remuneration and Nominations Committee

The Remuneration and Nominations Committee works to ensure that SMEC secures, motivates, and retains highly skilled and diverse senior executives and employees. The Remuneration and Nominations Committee must have at least two members, at least one of which is an independent non-executive director.

Note: Designated Board and Executive Committee members are current as at 1 June 2022.



Max Findlay
Chairman and
Non-Executive Director



Wong Heang Fine
Group CEO,
Surbana Jurong Group



Hari Poologasundram
CEO SMEC & CEO
International Surbana Jurong



Say Boon Lim
Non-Executive Director
and Chair of the Audit and
Risk Committee



Adil Al-Raeesi
Financial Controller, SMEC Group
Exited June 2021



Hari Poologasundram
CEO SMEC & CEO
International Surbana Jurong



Andy Atkin
Group Chief Financial Officer,
Surbana Jurong Group



Angus Macpherson
Director of Operations



George Simic
Director - Strategy, Growth, M&A
Africa, Americas, ANZ, SACA



Karen Atkinson
Deputy Chief Operating
Officer, ASEAN
Appointed October 2021



James Phillis
Chief Executive Officer,
Australia & New Zealand



Dr Uma Maheswaran
Chief Operating Officer,
South & Central Asia



John Anderson
Chief Operating Officer, Africa
Appointed December 2021



Adil Al-Raeesi
Financial Controller, SMEC Group
Exited June 2021



George Lasek
Chief Operating Officer, Americas
Exited February 2021



Tom Marshall
Chief Operating Officer, Africa
Exited January 2022

SMEC acknowledges and thanks exiting members for their significant contributions during their service.

The Executive Committee

SMEC's Executive Committee has primary authority for the management and monitoring of SMEC's operations, and the implementation of the Company Strategy subject to policies and procedures approved by the Board of Directors.

The Executive Committee is comprised of senior individuals with extensive experience in strategic and operational planning.



Cobblebank Stadium, Australia

Our global footprint



Australia, New Zealand (ANZ) & Pacific Islands

- Australia
- Fiji
- New Zealand
- Papua New Guinea
- Solomon Islands

Africa

- Ethiopia
- Kenya
- Namibia
- South Africa
- Tanzania

Americas

- Canada
- Chile
- USA

South Asia & Central Asia (SACA)

- Afghanistan
- Bangladesh
- Georgia
- India
- Kazakhstan
- Nepal
- Pakistan
- Sri Lanka
- Tajikistan
- UAE

Southeast Asia (SEA)

- Brunei
- Indonesia
- Malaysia
- Myanmar
- Philippines
- Singapore
- Vietnam

UK

- England

Since its formation, Singapore headquartered Surbana Jurong Group has invested in deepening its expertise in architecture, design, engineering, facilities management and security services, building a global group of specialist consulting and advisory firms.

With size and scale becoming increasingly important for companies to effectively compete in larger urbanisation and infrastructure projects, SMEC can draw on capabilities from a group of highly specialised consultancies to provide a full service offering to clients around the world based on years of global experience.

We continue to create synergies across the Surbana Jurong Group of companies and foster innovation to drive value for our clients. This allows us to compete in larger and more complex projects, and provide our clients with specialist expertise.

120+

Offices

40+

Countries

16,500+

Employees



