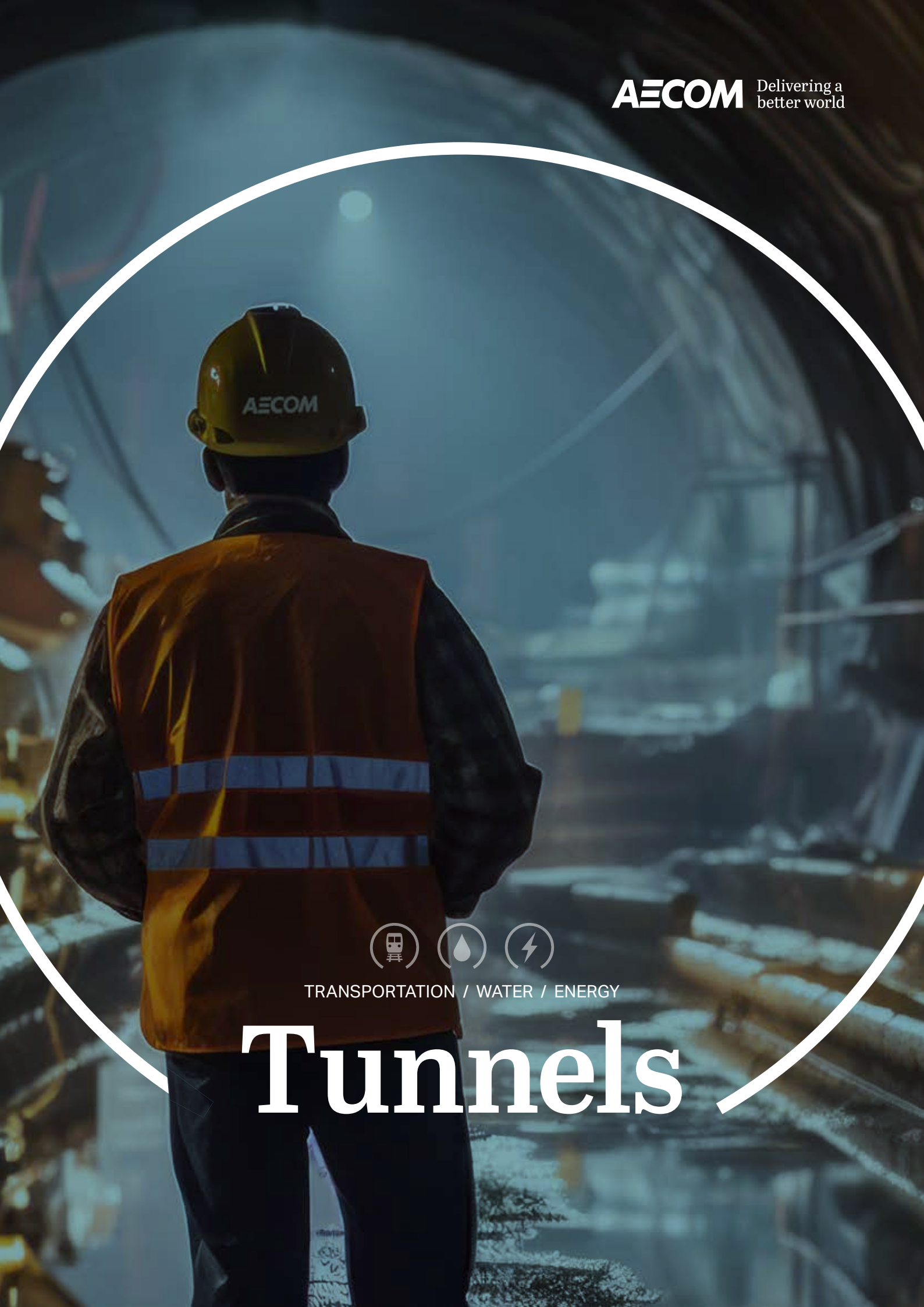
AECOM Delivering a better world



TRANSPORTATION / WATER / ENERGY

Tunnels

World-class solutions beneath the surface

Tunneling plays a vital role in enhancing connectivity, minimizing environmental impact, liberating space and are a strategic solution for various engineering challenges. These mega underground projects significantly contribute to infrastructure that enables economic growth, environmental sustainability and societal well-being.

Our tunnel experts are internationally recognized for designing and delivering transit, roadway, water and energy tunnel projects. With the latest technologies, we provide a full range of tunneling and underground structure design and management services partnering with both public and private sector clients.

Tunneling and underground expertise

- Cut-and-cover tunnels and stations
- Tunnel boring machine (TBM) tunnels
- Conventional tunnels (Drill and Blast and NATM/SCL/SEM)
- Immersed tube tunnels
- Jacked box tunneling
- Trenchless technology
- Shafts and deep excavation
- Raiseboring
- Ground improvement
- Tunnel MEP and systems
- Tunnel fire-life safety

Specialized services

- Feasibility study
- Economic/financial analysis
- Planning and environmental study
- Conceptual and detailed design
- Geological and hydrogeological study
- Geotechnical baseline reports
- Program and construction management
- Tunnel risk management
- Technical advisory
- Asset management, inspection and rehabilitation

$60M
in engineering tunneling services

400+
tunnel professionals globally

128
tunneling projects in 2023

Selected project locations

TRANSPORTATION

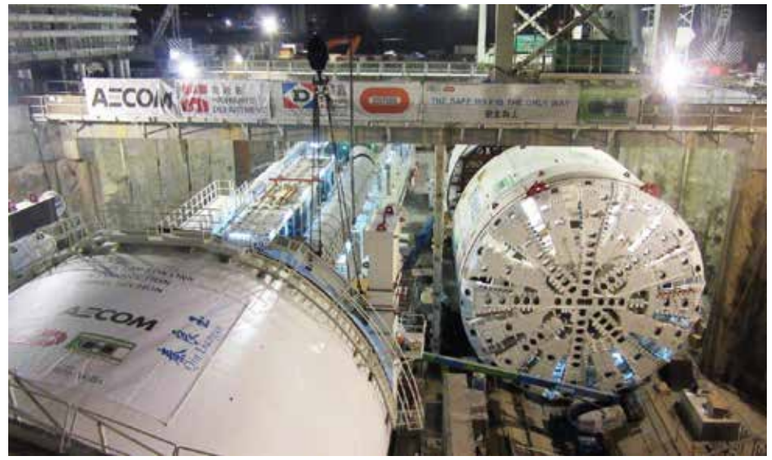
Tuen Mun-Chek Lap Kok Link

Hong Kong SAR

World's largest Tunnel Boring Machine at 17.63 meters

Two 4.5 kilometers long 14 meters diameter tunnels more than 50 meters below sea

Recipient of ITA and NCE Tunneling awards



The world's largest Tunnel Boring Machine (TBM) project

With increased traffic congestion and population growth, the Hong Kong Highways Department proposed the Tuen Mun-Chek Lap Kok Link, a strategic transportation link connecting the Northwest New Territories with the Hong Kong-Zhuhai-Macao Bridge and the Hong Kong International Airport. We were the Engineering Design Manager, providing detailed preliminary design, bridging documents, tender documents, bid review, as well as design and construction management services for the dual, two-lane underwater tunnels approximately 5 kilometers long. The contract included architectural, building, civil, geotechnical, tunneling, bridge structures, traffic, environmental impact assessment, landscaping, electrical and mechanical services.

This project was initially proposed as an immersed tube tunnel but there were several challenges associated with this method including: impacts to the ecological environment of the protected Chinese White Dolphin, diversion of the subsea power cables serving the airport, and dredging operations that affected the main shipping channels. As a result, we proposed an alternative that was more environmentally sensitive and shortened the overall construction schedule by three years.

Incorporating the 5-kilometer twin boring machines, not only resulted in a faster construction schedule, but also lower construction risk. Our scope included deploying the world's largest TBM at 17.6 meters in diameter to construct 549 meters of tunnel in soft ground, as well as two 4.3 kilometers long, 17.6 meters diameter tunnels, more than 50 meters below the shipping channel in 90% soft ground (marine deposits and weathered rock). The TM-CLKL became the first undersea bored highway tunnel in Hong Kong.

Design-build tunneling innovation that limits Combined Sewer Overflow

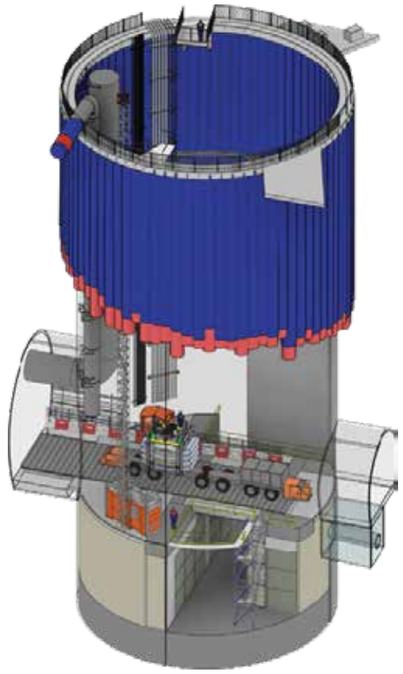
The Pawtucket Tunnel Project is the first part of the Narragansett Bay Commission (NBC) Phase III Combined Sewer Overflow (CSO) Program designed to reduce CSOs from the communities of Pawtucket and Central Falls in Rhode Island.

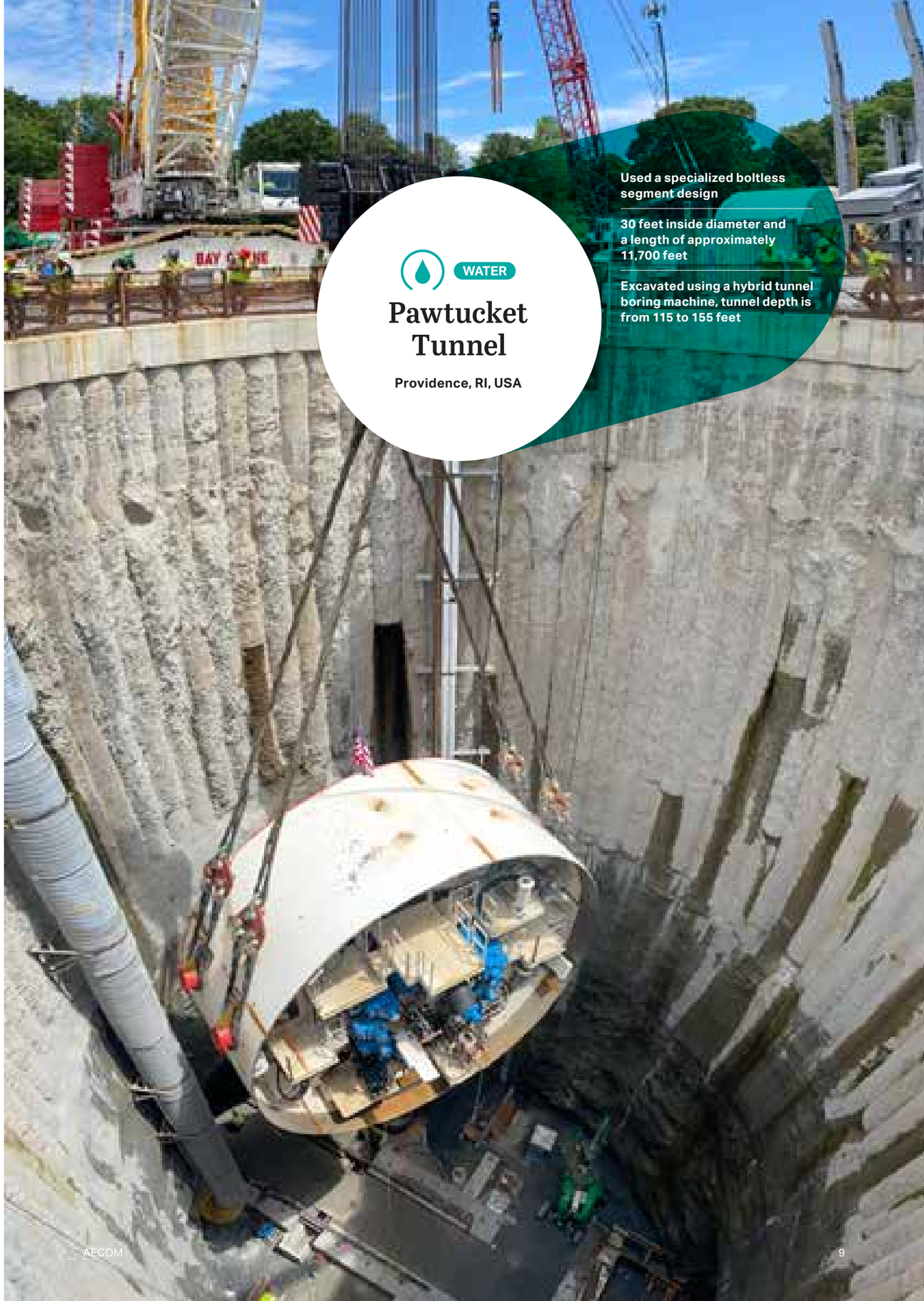
Projected to be complete by the end of 2024, the Pawtucket Tunnel has a finished inside diameter of 30 feet and a length of approximately 11,700 feet. The tunnel is built in complex sedimentary rock formations with depth to invert ranging from 115 to 150 feet.

The tunnel is excavated using a hybrid tunnel boring machine (TBM) capable of operating in a closed pressurized-face earth pressure balance (EPB) mode, if conditions warrant, and lined concurrently with gasketed precast steel fiber reinforced concrete segments. Other elements include an 80 foot finished diameter pump station shaft and four vortex-style drop shaft structures along the tunnel alignment. Microtunneling is used to construct a 1,000 feet connecting adit between one of the drop shafts and the mainline tunnel.

The innovative tunnel lining design consists of boltless precast segmental lining with large key segment to improve long-term durability. The lining is designed for all ranges of ground and hydrostatic conditions along the alignment, as well as for design seismic racking deformation. All the permanent project components are designed and constructed to meet a required 100-year design life.

The team worked with the NBC, the owner's project manager and state permitting agencies to fast-track multi-phase, multiple permit program for site work, soil disposal, muck management, groundwater treatment, and traffic management. A unique aspect of the permitting was to design and construct a new outfall for the discharges of the groundwater treatment system to the Seekonk River along a steep embankment. This outfall included diffusers along the riverbed that required approval by the US Army Corps of Engineers and do not impede the navigability of the Seekonk River.





TRANSPORTATION

Tseung Kwan O-Lam Tin Tunnel

Hong Kong SAR

7 kilometers long and 7.2 meters in diameter

Reducing journey time to Eastern Kowloon by 20 minutes at peak hours

Sustainable project scheme

Complexity by design: how design innovation is enabling complex project delivery

We were appointed by the Civil Engineering and Development Department of the HKSAR Government to provide investigation, preliminary design, detailed design and contract administration services for the Tseung Kwan O–Lam Tin Tunnel (TKO-LTT). The TKO-LTT was built to meet the traffic demand of Tseung Kwan O, a new town that is continuously developing. Our expertise in mined tunneling and creative design options gave the client the assurance that we were the best consultant to manage, deliver and complete this eminent project.

TKO-LTT consists of a dual two-lane highway about 3.8 kilometers long; of which about 2.2 kilometers is in the form of tunnel, linking the Cross Bay Link in the east, the Cha Kwo Ling Tunnel and Trunk Road T2 to Kai Tak in the west, and the existing Eastern Harbour Crossing (EHC), a road and rail tunnel across Victoria Harbour, in the south. A temporary cofferdam, a reclamation technology adopted for the first time in Hong Kong, was installed to safeguard the nearby waters from the reclamation works by enclosing a 7.4 hectare marine area. Another innovation involved encasing part of the ventilation building in the cavern, which cut down the carbon footprint and inert waste, and preserved precious habitat by preventing extensive slope cutting.

This major civil infrastructure project comprised many engineering disciplines such as tunnel blasting, surface blasting, reclamation, marine viaducts, grade-separated interchanges, footbridges, underpasses, buildings, geotechnical, environmental, landscaping, electrical and mechanical and traffic control and surveillance system. The complicated road alignment and multi-level bridgeworks, and the blasting works done near the metro tunnels, EHC, residential buildings and squatters posed extra challenges. Detailed planning and rigorous supervision were essential for the project's success.

TRANSPORTATION

Grand Central Madison

New York, NY, USA

- The two new tunnels increased train capacity to and from Manhattan by 50%
- More than 160,000 passengers per day save up to 40 minutes on their trips
- New hard-rock tunnel boring machines were created enabling new station caverns

New York City's next great transportation hub

A much-anticipated, one-seat ride to and from Manhattan is now a reality with the opening of Grand Central Madison. The new 700,000-square-foot rail terminal and concourse, located 10 stories below Grand Central Terminal, offers eight new tracks on four platforms — enabling direct Long Island Rail Road (LIRR) service to Manhattan's Midtown East business district while providing direct connections to existing Metro North Railroad and New York City Transit subway services. Previously known as East Side Access, this new transit terminal — the largest in the United States — marks a generational shift for transit and for travelers in the region.

We served as the overall program and construction manager for Grand Central Madison, and we also provided architectural and structural design services as a subconsultant to the general engineering consultant. The primary components of the project included new tunnel connections in Queens, connecting the LIRR Main Line and Port Washington Branch to the 63rd Street Tunnel under the East River. New hard-rock tunnel boring machines tunneled deep under midtown Manhattan from the 63rd Street, and the lower level at Second Avenue to the new LIRR terminal directly beneath the Grand Central Terminal (GCT). Directly below the GCT train shed, which are now new station caverns, is where the new passenger concourse is located that includes escalator, elevator and stair connections to Grand Central's dining concourse and the old arrivals waiting room, along with connections to the 45th Street and 47th Street cross-passages. This mega project opened in 2023 to much success and award fanfare.

WATER

Deep Tunnel Sewerage System Phase 2

Singapore

30 kilometers long South Tunnel, 70 kilometers of link sewers and a 12 kilometers deep sea outfall

The used water collection and purification project will have 100 years of maintenance-free design life

Tunnel diameters range from 4.5-7.5 meters

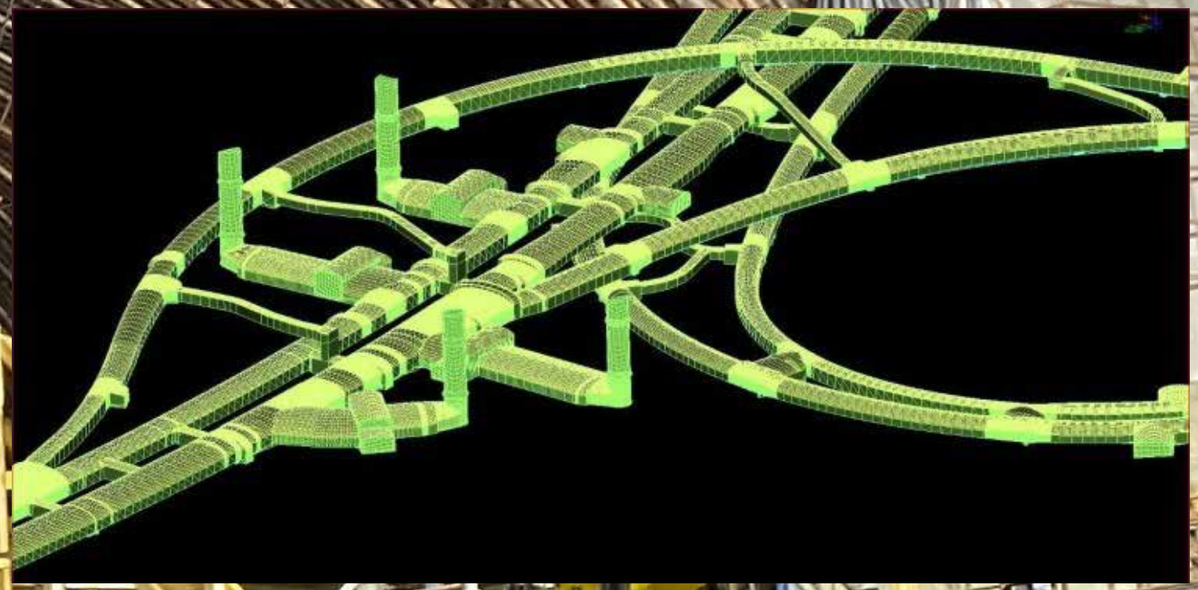
Enhancing water security

The Deep Tunnel Sewerage System (DTSS) provides a cost-effective and sustainable solution to support Singapore's continued growth and meet its long-term used-water infrastructure needs. The project uses deep tunnels to convey used water by gravity to centralized Water Reclamation Plants (WRPs) located at the coastal areas. Due to its scale and complexity, the construction of DTSS had to be carried out in two phases.

Phase 2 involves the construction of a 98 kilometers long network of deep tunnels and link sewers as well as the future Tuas Water Reclamation Plant (TWRP). With our joint venture partner, we were appointed by PUB, Singapore's National Water Agency, as the professional engineering services consultant overseeing the development, engineering and construction of Phase 2.

The tunneling works for Phase 2, which involved 19 tunnel boring machines, was completed in 2023. Major construction activities for the casting of the corrosion protection lining, pipe jacking works for the link sewers, and primary cast-in installation of the 32 roller gate shafts are ongoing.

When complete in 2026, the DTSS scheme will have successfully halved the space used aboveground for used water infrastructure, freeing up to 150 hectares of land for higher-value land use.



TRANSPORTATION

Stockholm Bypass

Stockholm, Sweden

One of the world's longest road tunnels

18 kilometers of subterranean tunnels, some of which are up to 100m deep

Twin finished tunnels of 4.8 meters x 13.5

Delivering Sweden's new major road tunnel

We dig deep into our work on the Stockholm Bypass – a new 21 kilometers highway bypassing the center of the Swedish capital – which boasts one of the world's longest road tunnels. Partnering with a local consultancy, we designed one of Sweden's largest civil engineering projects. This new dual, three-lane highway forms part of the existing E4 highway, linking the northern and southern parts of the Swedish capital. Of the road's 21 kilometers, 18 kilometers will be in subterranean tunnels – one of which will be among the world's longest in the proximity of a city.

When complete, the bypass will not only relieve congestion in the city center but also reduce impact on the environment and surrounding residential areas. Our work on the bypass comprises two major components. Firstly, building new bridges, underpasses, tunnels and retaining walls, and upgrading current structures at the major Akalla/Häggvik interchange. Secondly, minimizing environmental impact when excavating and transporting the 19 million tons of rock to accommodate the tunnels.

Due to the project's magnitude and scale, collaboration has been critical. This has involved a coordinated effort of more than 500 designers from 19 disciplines across seven countries. Together with our partner, we're helping the client navigate complex challenges unique to tunneling underground, such as solving water leakage issues and problems with rock quality.

WATER

Lee Tunnel

London, UK

Part of the 25 kilometers Thames tidal sewer tunnel

Deepest tunnel ever constructed in London , at 80 meters deep

Improved water quality in the River Thames

London's deepest sewer

The Lee Tunnel, constructed as the first phased part of the Thames Tideway Project, conveys Abbey Mills storm flows to Beckton Sewage Treatment Works, and helps solve the sewage discharging into the River Thames via the River Lee. We carried out the reference design and shaft work of the 7 kilometers long and 7.2 meter diameter tunnel. We also were involved in carrying out the settlement assessment and analyzing the impact of ground movements on third party structures.

The tunnel was driven by a tunnel boring machine (TBM) from an 80 meters deep, 25 meters ID shaft at Beckton Sewage Treatment Works through chalk to a reception shaft at Abbey Mills Pumping Station in Stratford. The shaft at Beckton used 100 meters deep diaphragm walls, which are 1.5 meters thick. Diaphragm walls of such dimensions are the largest of any built in Europe. One of the main challenges for the shaft design was the flotation given the great depth of the shaft and high ground water levels. The tunnel lining comprises reinforced segmental primary lining and castin-situ reinforced concrete secondary lining.

TRANSPORTATION

Hong Kong-Zhuhai-Macao Bridge Link

Hong Kong SAR

The 5,664 meters immersed tunnel is the longest highway immersed road in the world

Established a new land transport link between the east and west coasts of the Pearl River

Recipient of ITA, ENR and NCE Tunneling Awards

World class engineering in the Pearl River

Passing through the Pearl River Estuary, the Hong Kong-Zhuhai-Macao Bridge (HZMB) is a mega cross-harbour link which connects Hong Kong, Zhuhai and Macao to form a key portion of the National Express Highway network. AECOM, as a member of the consortium led by China Communications Construction Company Limited, was commissioned as the construction management consultant, providing project management and risk management services for an immersed tube tunnel and two artificial islands, as well as offering technical advisory for the design and construction of the immersed tunnel of this mega project.

Construction on the HZMB has been taking place since 2010 and was successfully completed in 2018. With a total length of 35 kilometers, the main crossing of HZMB which adopts a bridge-cum-tunnel dual 3-lane highway arrangement runs from an artificial island off Gongbei of Zhuhai and reaches Guangdong-Hong Kong boundary, passing through major navigation channels including the west side of Lingding Channel, the Tonggu Channel, the Qingzhou Channel, the Jiuzhou Channel and the Jianghai Channel, of which 6.7 kilometers were carried in immersed tunnel under water and two artificial islands. The 5,664 meters immersed tunnel is the longest highway road immersed tunnel in the world. Since the project was built in the open sea, the design and construction of tunnels and artificial islands faced a series of world-class engineering challenges like long-distance ventilation and safety design (6.7 kilometers in length and max 43 meters in depth) of the tunnel, pre-fabrication, towing and installation under high water pressure, as well as construction of the west and east artificial islands.

The project received three major international tunneling awards. Completion of the bridge met the demand of passenger and freight transportation from Hong Kong, the Mainland and Macao, and established a new land transport link between the east and west coasts of the Pearl River, enhancing the economic and sustainable development in the Greater Bay Area instead of region.

ENERGY

London Power Tunnels

London, UK

Part of a 60 kilometers deep-level tunnel scheme to reinforce electricity transmission network in London, UK

Scope included the design and construction of approximately 32.5 kilometers of 3 meters ID tunnels

Helping with London's future energy demand

Phase 2 of National Grid's London Power Tunnels scheme will replace three sections of existing buried electricity cables in South London with a new purpose-built cable tunnel system. The routing of transmission cables underground through tunnels will minimize disruption both during the construction works and throughout the life of the cable network, while also providing the ability to increase capacity.

Phase 2 of the scheme is divided into packages of works, with Package 2 consisting of the tunneling and shaft works, worth approximately £350m-400m. We were appointed as the designer, providing technical advice, detailed design, design verification and addressing the various design interfaces for the project.

The scope of the works includes the design and construction of approximately 32.5 kilometers of 3 meters ID tunnels in 5 drives. Due to the scheme alignment, the tunnels will be constructed through most of the stratigraphy of the London Basin using Open Face and Earth Pressure Balance Tunnel Boring Machines. The tunnel linings will be formed using fibre-reinforced segments. We were also involved in carrying out the settlement assessment and analyzing the impact of ground movements on third party structures, and the design of a reception portal at the existing Wimbledon shaft at the Western end of the alignment.

TRANSPORTATION

Elizabeth Line

London, UK

Europe's largest construction project

Used 8 tunneling machines

4.9M tons of excavated material created a new 1,500-acre nature reserve

Going underground on Europe's largest construction project

The Elizabeth Line, formerly known as Crossrail, is among the most significant infrastructure projects ever undertaken in the United Kingdom. From improving journey times across London, to easing congestion and offering better connections, it has changed the way people travel around the capital.

The route runs over 62 miles (100 kilometers) from Maidenhead and Heathrow in the west, through tunnels under central London to Shenfield and Abbey Wood in the east. A total of eight tunneling machines were used, each tunneling machine was a 1,100-ton (1,000-metric ton), 492-foot (150 meters) long underground factory with 20-person 'tunnel gangs' working in shifts throughout the day.

At peak times, the tunneling machines aimed for approximately 328 feet (100 meters) of tunneling progress per week — as the tunneling machines moved forward, precast concrete segments were built in rings behind — 250,000 tunnel segments were used to line the 26 miles (42 kilometers) of tunnels with a 6.2 meter diameter.

4.9 million tons (2.7 million metric tons) of excavated material from the tunnels were shipped to Wallasea Island in Essex where a nature reserve was created.

Credit: Crossrail Ltd./John Zammit Photography

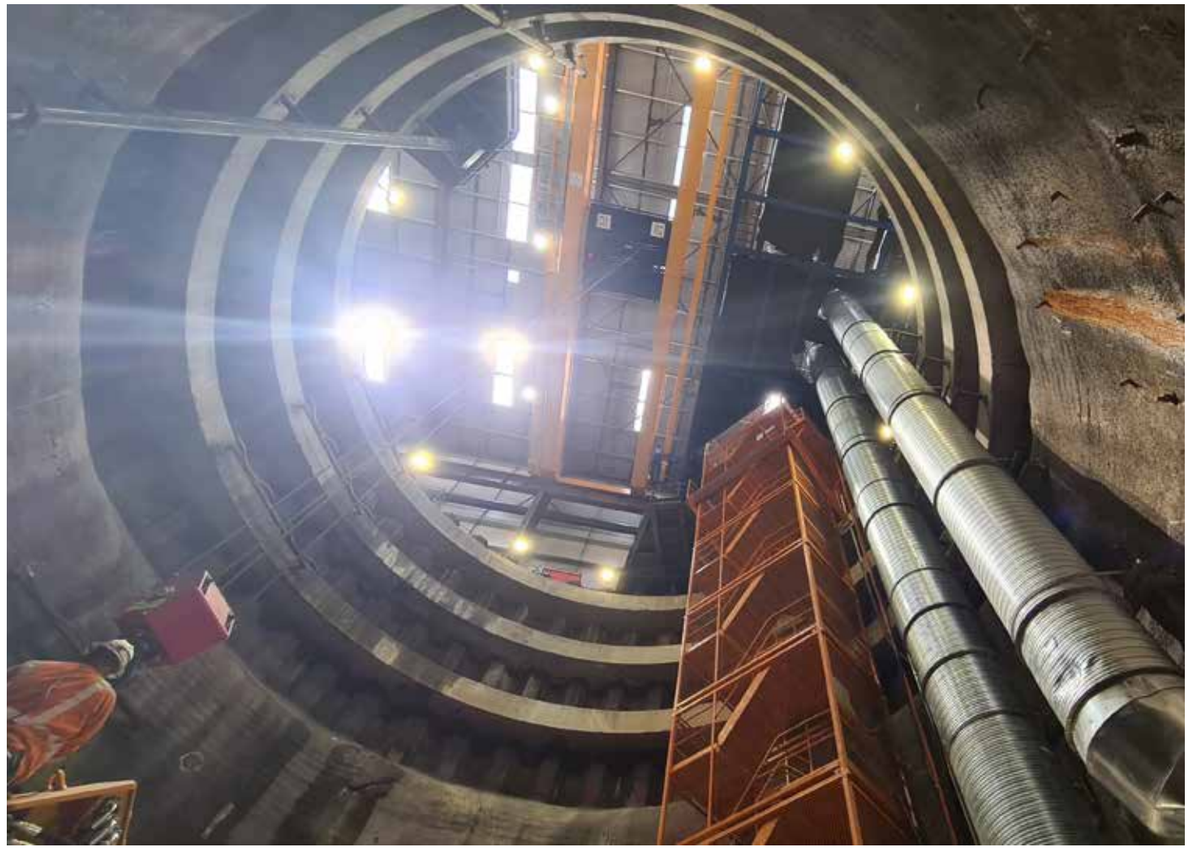
Auckland's City Rail Link pushed new digital engineering boundaries

The City Rail Link (CRL) project is set to be a game-changer for Auckland's public transport with 3.45 kilometers of underground rail tunnels that will more than double the city's rail capacity. Along with our design and construction delivery team, known as the Link Alliance, we pushed the boundaries of what's possible using BIM on linear infrastructure. The team has improved efficiency and reduced risk on the project, and at the same time enabled greater visibility of the overall project design.

The digital engineering team is using a common data environment, to ensure that all 200+ project designers and engineers are working in a single online location with the latest updated designs. The geographically dispersed engineers, across eight different teams, can collaborate and live-share over 50 different models, and simultaneously interrogate and review the current design via a web browser, without any additional software or hardware requirements. We employed a combination of traditional Building Information Modelling (BIM) processes, as well as some newer parametric design and generative design processes. This reduced tunnel design modelling time from weeks to hours. When designing the cross-passages (short tunnels that connect two parallel tunnels) in the main tunnels, we used a completely parametric design approach. A cross-passage is a highly complicated element that must be placed based on the physical arrangement of the precast tunnel segments (rotation, tapering, key segment position, etc). Visual programming and computational design have been critical in performing a theoretical calculation of the tunnel boring machine (TBM) ring placement based on an algorithm that aims to minimize the diversion from the design alignment.

We also deployed generative design within the tunnel design to create the 'kinematic envelope'. This is the space allocated for the safe passage of the moving trains through the tunnel. Engineers used the modelled kinetic envelope to check that the design met the requirements and ensure that no element would be positioned in a way to obstruct the safe passage of the train. This generative design approach saved a considerable amount of time, by reducing several iterations which normally involve interaction with many different disciplines and technical experts.

When open in 2024, CRL will transform the downtown Britomart Transport Centre into a two-way through-station that better connects the Auckland rail network by at least doubling the rail capacity.



TRANSPORTATION

City Rail Link

Auckland, New Zealand

CRL is a 3.45 kilometers twin-tunnel underground rail link up to 42 meters below Auckland city center

Innovative Link Alliance pushed the boundaries of what's possible using BIM on linear infrastructure

TRANSPORTATION

West Connex

Sydney, Australia

NSW's largest urban transport infrastructure project

Enabled $20B in economic benefits to NSW

Reduced travel timed, improved road capacity

Designing the missing piece to deliver a connected transportation network for Sydney

The M4-M5 project is a major infrastructure project in Sydney that aims to improve the city's transportation network. The M4-M5 Main Tunnel with the Rozelle Interchange and Iron Cove Link will constitute the M4-M5 Link, which together with the rest of WestConnex and Western Harbour Tunnel, Sydney Gateway and F6 Extension, will form a network of motorways that provides for the efficient flow of traffic between areas to the west of Sydney and destinations such as the CBD, Sydney Airport, Port Botany and areas to the south and north of Sydney. In addition, the M4-M5 Link will provide a western bypass to the city and north-south connectivity to and from local destinations.

We worked on the complete project phase of WestConnex M4-M5 Link and Rozelle Interchange, from option development to supporting the delivery of the D&C contract. Before we were awarded the Technical and Environmental Advisor for M4-M5 Link in 2016 and Rozelle Interchange in 2018, AECOM was engaged as Interim Technical Adviser by Sydney Motorways Corporation – SMC (later WestConnex – WCX) to further develop the Strategic Project Definition report (September 2014) and prepare the Project Definition and Detailed Plan Report (July 2015). During the strategic assessment phase, our technical team worked closely with the SMC project team, to explore an exhaustive list of options. With the collaboration of the SMC project team a preferred option was then confirmed, and AECOM further developed the option to reference design for the Request for Tender (RFT) phase.

The twin mainline motorway tunnels between the M4 East at Haberfield and the M8 (previously known as New M5) at St Peters are approximately 7.5 kilometers long. The tunnels are designed to accommodate up to four lanes of traffic in each direction. The M4-M5 Link Stage 1 – Mainline Tunnels project has been completed in 2023, with roadheaders carving rock 43 meters below ground. The tunnels are the final and most critical components of the WestConnex project.

TRANSPORTATION

Mumbai Metro

Mumbai, India

One of the world's longest metro tunneling projects, with 27 metro stations

33.5 kilometers (67 kilometers) of twin bore tunnels

Reduced road congestion by nearly 15%

Delivering India's first underground metro route

Cited by The Wall Street Journal as "one of the world's most audacious transit projects", the Mumbai Metro Line 3 (MML3) – also known as Aqua Line 3 – is set to be India's first fully underground metro route. The line is expected to cut commute times by up to 50 percent, positively impacting millions of commuters who spend as much as four hours per day travelling to and from work.

Our team is providing specialist design, supervision, quality control, safety and control management services for this 21 miles (33.5 kilometers) long metro facility, which is completely underground and joins Colaba – Bandra – SEEPZ in Mumbai, connecting south Mumbai to the city's western suburbs. It is one of the world's longest metro tunneling projects with 27 metro stations, and includes tunneling directly underneath several working facilities including historic buildings, temples and residential areas.

WATER

Inner Doha Re-sewerage Implementation Strategy (IDRIS)

Doha, Qatar

Tunnels extend 45 kilometers

Internal diameter of the tunnels range between 3 meters and 4.5 meters

Maximum depth of 60 meters

Future-proofing wastewater infrastructure

The Inner Doha Re-sewerage Implementation Scheme (IDRIS) was a three-year project to upgrade the capital's aging wastewater infrastructure, raise living standards and reduce pressure on the existing drainage network. As part of a joint venture, we provided lead design services and support during construction for two of the three IDRIS main sewer tunnels.

The tunnels run beneath the southern part of the capital, extending 45 kilometers through the southwest area of Doha where a deep pumping station takes sewage to the surface for treatment and recycling via irrigation. The internal diameter of the tunnels range between 3-4.5 meters. With a maximum depth of 60 meters, the tunnels presented several technical challenges: abnormally high groundwater pressure, karstic geology, and potential of high groundwater flows into shafts and tunnels.

Based on our geotechnical and groundwater advice, different approaches were utilized to manage the groundwater at the shafts. Solutions included a vertical shaft machine, grouting followed by open excavation, and diaphragm walls. The new lines are designed to be self-cleaning and maintenance-free, with a service life of 100 years. Materials were selected to withstand exposure to the corrosive sewer environment and hypersaline ground conditions.

Completed on schedule in early 2019, the new gravity system has facilitated the closure of more than 20 old pump stations located in residential and commercial areas, while ensuring Doha's wastewater infrastructure can support predicted population growth in years to come.

Connecting Spain's high-speed rail system

AECOM carried out the preliminary and detailed designs for ADIF's high-speed line between San Isidro and Orihuela, inclusive of a new rail tunnel. The Callosa Tunnel is approximately 2,050 meters long, 300 meters deep with an excavation size of 12.6 meters by 11.3 meters. The alignment travels through the localities of San Isidro, Granja de Rocamora, Cox, Callosa de Segura, Redován and Orihuela, all of them in the Spanish province of Alicante. Given the length of the tunnel, an evacuation gallery system is necessary. The proposed solution consisted of a 1,000 meters gallery parallel to the tunnel, discontinuous or interrupted in the central part of the tunnel. At these points, the parallel gallery joins the railway tunnel by means of two connecting galleries.

The double-track single-tube tunnel crosses the Callosa mountains and the new Callosa-Cox station. The work on the tunnel includes geometric design, construction system, support and coating, waterproofing and drainage, instrumentation and control, specifications and measurements for budgeting. Some of the notable risks that were overcome in the detailed design were the presence of karstifications, sub-horizontal stratification, instability of the face, and detachments at portals due to the limestone mountain and steep cliffs.

TRANSPORTATION

Callosa Tunnel

Callosa, Spain

Tunnel for high-speed rail tunnel

NATM/SEM construction by Roadheaders in Limestone up to 300 meters deep

2,050 meters long

Tunneling for renewable energy

Hydro-Quebec developed the La Romaine hydroelectric complex to increase generating capacity, develop Quebec's hydropower potential and meet current energy needs without jeopardizing the energy supply of the future. AECOM's involvement in the project began in 2008 and spanned 15 years. We provided the detailed engineering design and technical support during the construction of all power plants and conducted multiple inventories, mapping contracts and environmental monitoring.

We received a Tunneling Association of Canada award for La Romaine-3 in recognition of our outstanding design of the headrace tunnel and the related works. The scope included a surge chamber and its connecting gallery, flow distributor and 1.8 kilometers of penstocks. The four powerhouses boast an impressive total installed capacity of 1,550 megawatts and can supply 8 terawatt hours of clean energy, enough to supply 470,000 homes. This award-winning project aligns with Hydro-Québec's commitment to sustainable development and is a testament to the immense contribution to Quebec's energy transition.

From technical design to environmental impact studies and comprehensive on-site support, we ensured a seamless and efficient project delivery, despite the complex challenges posed by the remote location, including the use of innovative measures such as prefabrication and three-dimensional modeling to advance the project.

ENERGY

Romaine Hydroelectric Complex

Havre-Saint-Pierre, Quebec, Canada

Tunneling Association of Canada, Canadian Infrastructure Project of the Year, Romaine-3 Head Race Tunnel, 2016

1.2 kilometer supply gallery with a truncated circular shape (11.5 meter high by 15.5 meter wide)

Two 5.9 meter diameter by 100 meter long penstocks.

ABOUT AECOM

AECOM is the world's trusted infrastructure consulting firm, delivering professional services throughout the project lifecycle – from advisory, planning, design and engineering to program and construction management. On projects spanning transportation, buildings, water, new energy, and the environment, our public- and private-sector clients trust us to solve their most complex challenges. Our teams are driven by a common purpose to deliver a better world through our unrivaled technical and digital expertise, a culture of equity, diversity and inclusion, and a commitment to environmental, social and governance priorities. AECOM is a Fortune 500 firm and its Professional Services business had revenue of $14.4 billion in fiscal year 2023. See how we are delivering sustainable legacies for generations to come at aecom.com and @AECOM.