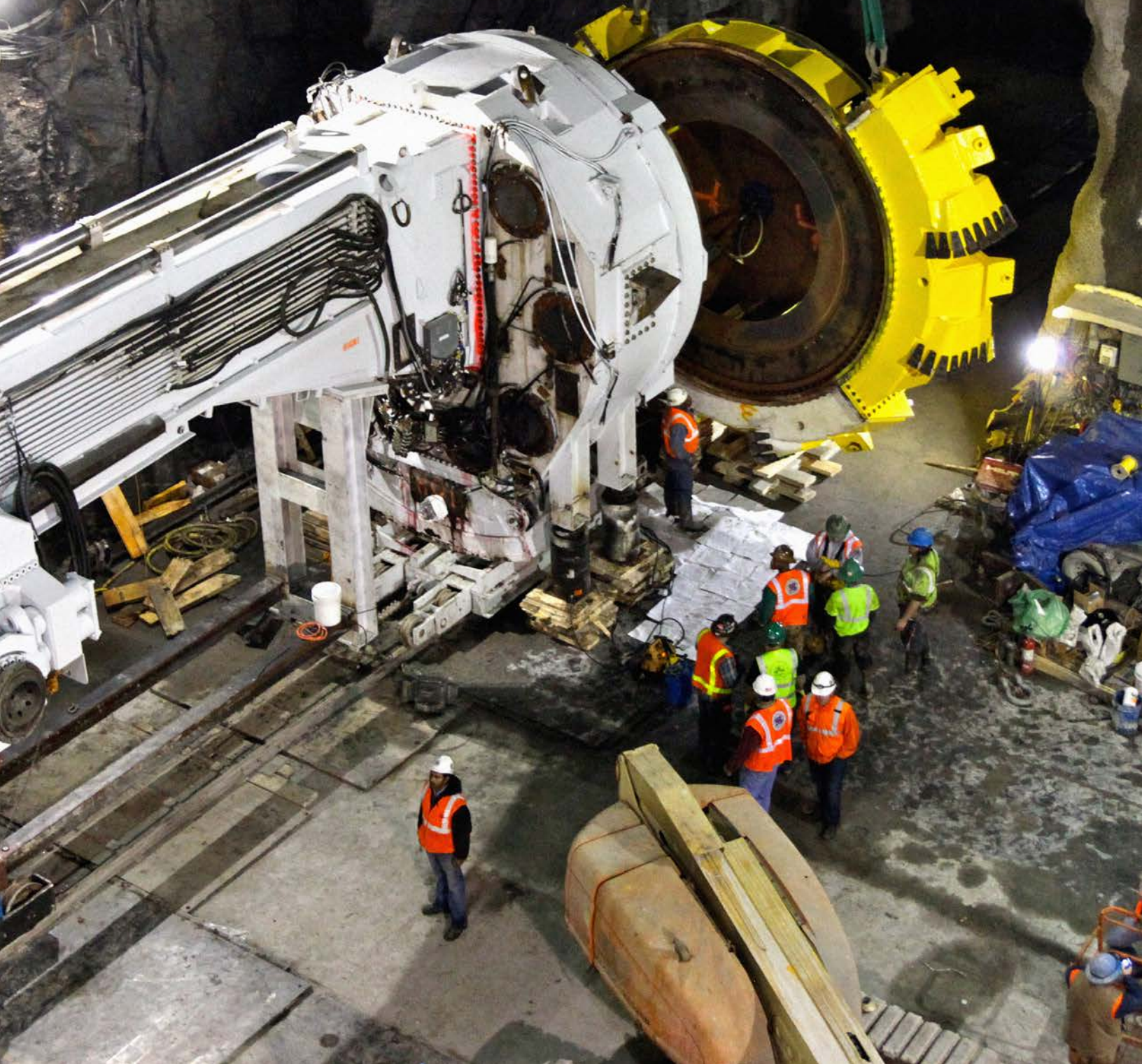


# Hard Rock Tunnel Boring

Delivering complex transportation, water  
and energy tunnels around the world



# Integrated tunneling solutions for challenging rock conditions

When it comes to hard rock tunnel boring, what truly sets us apart is our outstanding performance, consistent execution of the work and our fully integrated service offering across the entire tunnel life cycle.

With more than 500 tunneling professionals, 1000 geotechnical engineers and experience on over 2,000 miles of tunnel projects worldwide, we help you deliver large-scale tunnels in the most difficult rock settings.



## Services for all types of tunnels

- Program management
- Construction management
- Alternative delivery
- Planning and feasibility studies
- Geotechnical site investigation
- Geophysical investigation
- Environmental site assessments and spoil disposal evaluation
- Geotechnical baseline and data reports
- Tunnel risk registers
- Fractured rock, hard-rock and mixed-face ground characterization
- Squeezing and swelling rock
- Tunnel and shaft initial support design
- Tunnel and shaft permanent support design
- Tunnel lining condition assessments and rehabilitation design
- Drill and blast, Road Header, SEM and mechanical excavation technologies
- Tunnel boring machine (TBM) selection and performance evaluation
- Grouting design
- Groundwater control
- Underground construction impact assessments
- Engineering cost estimates for construction
- Tunnel inspection, geologic mapping and resident engineering
- Instrumentation and monitoring

Left:

**New Irvington Tunnel**, Fremont, California, U.S. – San Francisco Public Utilities Commission

Cover:

**Second Avenue Subway**, New York, New York, U.S. – MTA Capital Construction & New York City Transit



- 1 **Grand Central Terminal – East Side Access Development**, New York, New York, U.S. – Metropolitan Transportation Authority Construction Company
- 2 **Tom Lantos (Devil’s Slide) Tunnels**, Pacifica, California, U.S. – California Department of Transportation
- 3 **Second Avenue Subway**, New York, New York, U.S. – MTA Capital Construction & New York City Transit. (AECOM is a two-thirds partner in the Second Avenue Subway joint venture.)
- 4 **San Francisco Central Subway Project**, San Francisco, California, U.S. – San Francisco Municipal Transportation Agency

- 5 **Deep Rock Tunnel Connector**, Indianapolis, Indiana, U.S. – Citizen’s Energy Group
- 6 **Romaine Hydroelectric Powerhouse**, Québec, Canada – Hydro-Québec
- 7 **Clem Jones Tunnel (CLEM7) Southern Portal**, Brisbane, Australia – River City Motorway Pty Ltd.
- 8 **Mumbai Metro**, Mumbai, Mumbai, India – Mumbai Metro Rail Corporation Limited

**About AECOM**

AECOM is the world's premier infrastructure firm, delivering professional services throughout the project lifecycle – from planning, design and engineering to consulting and construction management. We partner with our clients in the public and private sectors to solve their most complex challenges and build legacies for generations to come. On projects spanning transportation, buildings, water, governments, energy and the environment, our teams are driven by a common purpose to deliver a better world. AECOM is a *Fortune 500* firm with revenue of approximately \$20.2 billion during fiscal year 2018. See how we deliver what others can only imagine at [aecom.com](http://aecom.com) and [@AECOM](https://twitter.com/AECOM).

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