

# Tunnels

AND TUNNELLING



*The complete A to Z guide of consultants, contractors,  
and manufacturers of equipment & materials*

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**I**N REVIEW of 2015 there are many tunnelling milestones among projects of all sizes around the globe. A particular highlight, as this deadline coincides with the Paris climate talks, is the Q&A session released earlier this year by International Tunnelling Association (ITA)'s president, with Soren Degn Eskesen.

He reports that not only are decision makers and organisations now talking about underground space and how to include the underground in city planning to make cities more resilient; the relevant UN bodies are consulting ITA more and more to learn the possibilities tunnelling has to offer in this regard.

"Tunnelling and underground space is now becoming part of UN policy." He adds, "this is only a first step but it is significant." He's right. Increasing policy makers' comprehension of the benefits of underground space is invaluable. Over the last decade the industry has weathered a global recession among other financial instabilities across various regions. Through this period the industry has adapted and whatever adjustments, should seen as preparation for the bigger challenges ahead.

The goals for the industry this year will be to continue those important conversations promoting underground solutions with decision makers internationally and locally. Continue developing innovative solutions in financing, design and construction methods. With acknowledgment worldwide that effects of climate change are visible, the work of the tunnelling industry is more important than ever.

**Nicole Robinson**  
Editor



### Listings Guide

#### RELIABILITY

All the information supplied in this book was submitted by individual companies listed. The accuracy of the listings is wholly dependent on the accuracy of the information supplied.

#### CURRENCY

All currency values are expressed as USD millions unless stated otherwise.

#### LEGEND

- ADECO-RS: The analysis of controlled deformation in rocks and soils
- C&C: Cut and cover
- D&B: Drill and blast
- EPBM: Earth pressure balance machine
- HRTBM: Hard rock tunnel boring machine
- IMT: Immersed tube
- ME INSTALL: Mechanical and electrical installation
- NATM: New Austrian Tunnelling Model
- RB: Raised boring
- REFURB: Refurbishment
- RH: Roadheader
- SAFETY INSTALL: Installation of safety equipment
- SCL: Sprayed concrete lining
- STBM: Slurry tunnel boring machine
- TBM: Tunnel boring machine

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## PROJECT MAPS

A snapshot of tunnelling projects around the world from the database of *Tunnels and Tunnelling* publisher *timetric*

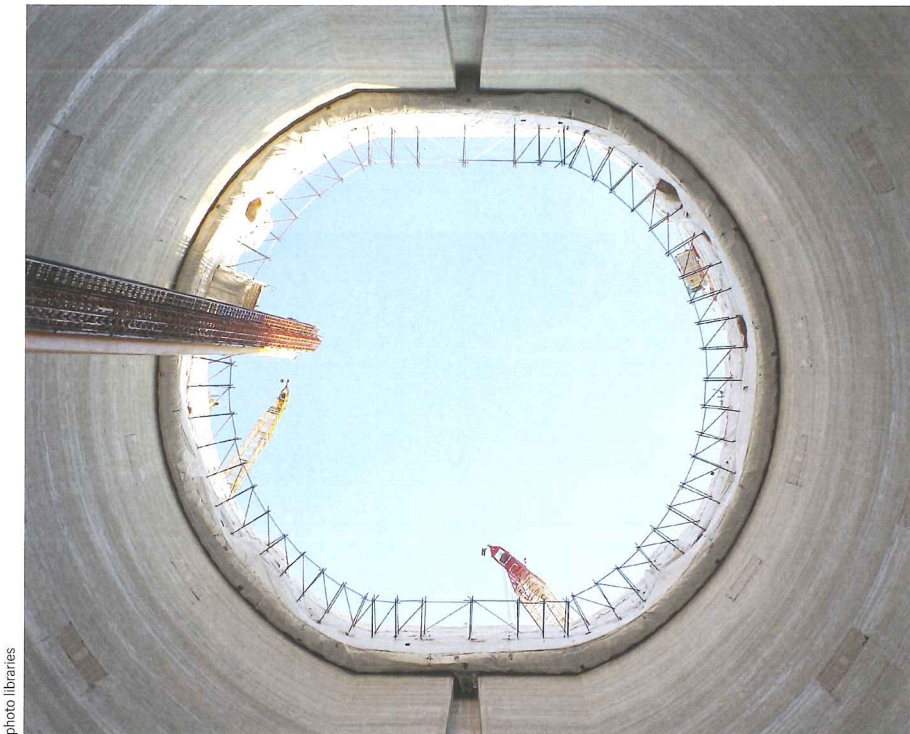
# NORTH AMERICA

North American tunnelling, while not as healthy as previous years, remains strong



## Key

- |  |   |
|--|---|
| 1. Romaine-3 Hydroelectrical Complex   | 18. Annacis Main No. 5 Water Tunnel       |
| 2. Mont Royal Tunnel                   | 19. Evergreen Line Rapid Transit Project  |
| 3. Montreal Water Main                 | 20. East Side Access                      |
| 4. Eglinton Crosstown Light Rail       | 21. Second Avenue Subway                  |
| 5. Ottawa Light Rail Transit           | 22. Delaware Aqueduct Bypass              |
| 6. Hanlan Feedermain Project           | 23. Clean Rivers Project                  |
| 7. West Trunk                          | 24. Midtown Immersed Tube Tunnel          |
| 8. Mid-Halton Outfall                  | 25. OARS Sewer Tunnel                     |
| 9. Nose Creek Valley                   | 26. Project Clean Lake                    |
| 10. West Edmonton Sanitary Sewer       | 27. Akron CSO projects                    |
| 11. Upper Lillooet HEF                 | 28. Dig Indy                              |
| 12. Boulder Creek HEF                  | 29. Alaska Way Viaduct replacement tunnel |
| 13. Big Silver HEF                     | 30. Northgate Link Extension              |
| 14. John Hart Generating Station       | 31. Lake Mead Water Low Lake Pump Station |
| 15. McLymont Creek Hydro project       | 32. Los Angeles Subway Expansion          |
| 16. Port Mann Water Supply Tunnel      |   |
| 17. Second Narrows Water Supply Tunnel |   |



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GRANDS PROJETS

# LATIN AMERICA

Central America in particular has embarked on an impressive pipeline of works



## Key

- |   |   |   |
|---|---|---|
| 1. Rio de Janeiro Metro Expansion                                 | 19. La Linea Highway Tunnel                       | 35. Alto Piura irrigation and hydropower project                |
| 2. Mario Covas Northern Stretch Ring Road Development – Sao Paulo | 20. Misticuni River Water System Development      | 36. Chuquicamata underground mines development                  |
| 3. Toluca–Mexico City Rail System                                 | 21. Cutzamala Potable Water Distribution System   | 37. Ruta Del Sol highway development                            |
| 4. Coca Codo Sinclair hydropower plant                            | 22. Pando Monte Lirio hydropower project          | 38. Santa Teresa hydropower project                             |
| 5. Alto Maipo hydropower plant                                    | 23. Santa Catrina highway duplication             | 39. Cerro del Aguila hydropower plant                           |
| 6. Guadalajara Light Rail Line 3 Development                      | 24. Belo Monte hydropower project                 | 40. Bello Wastewater treatment plant                            |
| 7. Quito Metro System   | 25. Bogota Metro System                           | 41. Escenica Alterna Urban Tollroad Development                 |
| 8. Panama City Metro Line 2                                       | 26. Pescadero Ituango Hydropower plant            | 42. El Purgatorio Reservoir                                     |
| 9. Curitiba Metro Link  | 27. Porto Maravilha road tunnel                   | 43. Americo Vespucio Oriente highway project                    |
| 10. Agua Negra Tunnel Development                                 | 28. Quellaveco Copper Processing Plant            | 44. Barra di Tijua to Deodoro trans Olimpica Expressway project |
| 11. Santiago Metro Line 3   | 29. Tunel Emisor Poniente                         | 45. Toro III hydropower plant                                   |
| 12. Mollepata hydropower plant                                    | 30. Cochabamba water treatment system             | 46. Sogamoso hydropower plant                                   |
| 13. Porce III hydropower plant                                    | 31. Sao Francisco River Water Integration project | 47. Patuca hydropower plant                                     |
| 14. Emisor Oriente sewer tunnel                                   | 32. Revantazon hydropower plant                   | 48. Huanza hydropower plant                                     |
| 15. Santo Domingo Metro Line II Extension                         | 33. Produastro–Angamarca hydropower project       | 49. Cayambe–Pedro Moncayo irrigation systems project            |
| 16. Baralt Road Tunnel  | 34. Chaglla hydropower project                    | 50. La Yesca hydropower plant                                   |
| 17. Los Condores Hydroelectric Plant                              |   |   |
| 18. Chicoasen II Hydroelectric Power Plant                        |   |   |



## H+E on track in London

**London / Great Britain.** Restricted spatial conditions necessitated by dense development, difficult infrastructure with extremely high congestion where faults triggered by work in the soil could cause full collapse, an ambitious schedule – these are only some of the factors which make realization of Europe's largest infrastructure project – the Crossrail in London – an extreme challenge for the planners and companies involved. Swift removal of excavated material is an absolute must for smooth operations. Which is why H+E is deployed in the new Crossrail tunnel.

### Technical data:

- Tunnel Diameter: 6.20 m
- Min. Radius: > 580 m
- Mineral: EPB
- TBM Supplier: Herrenknecht
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- Belt Width: 800 mm
- Capacity: 650 t/h
- Installed Power: 355 kW
- Belt Storage Capacity: 500 m horizontal (double stock)
- Installation: 2013



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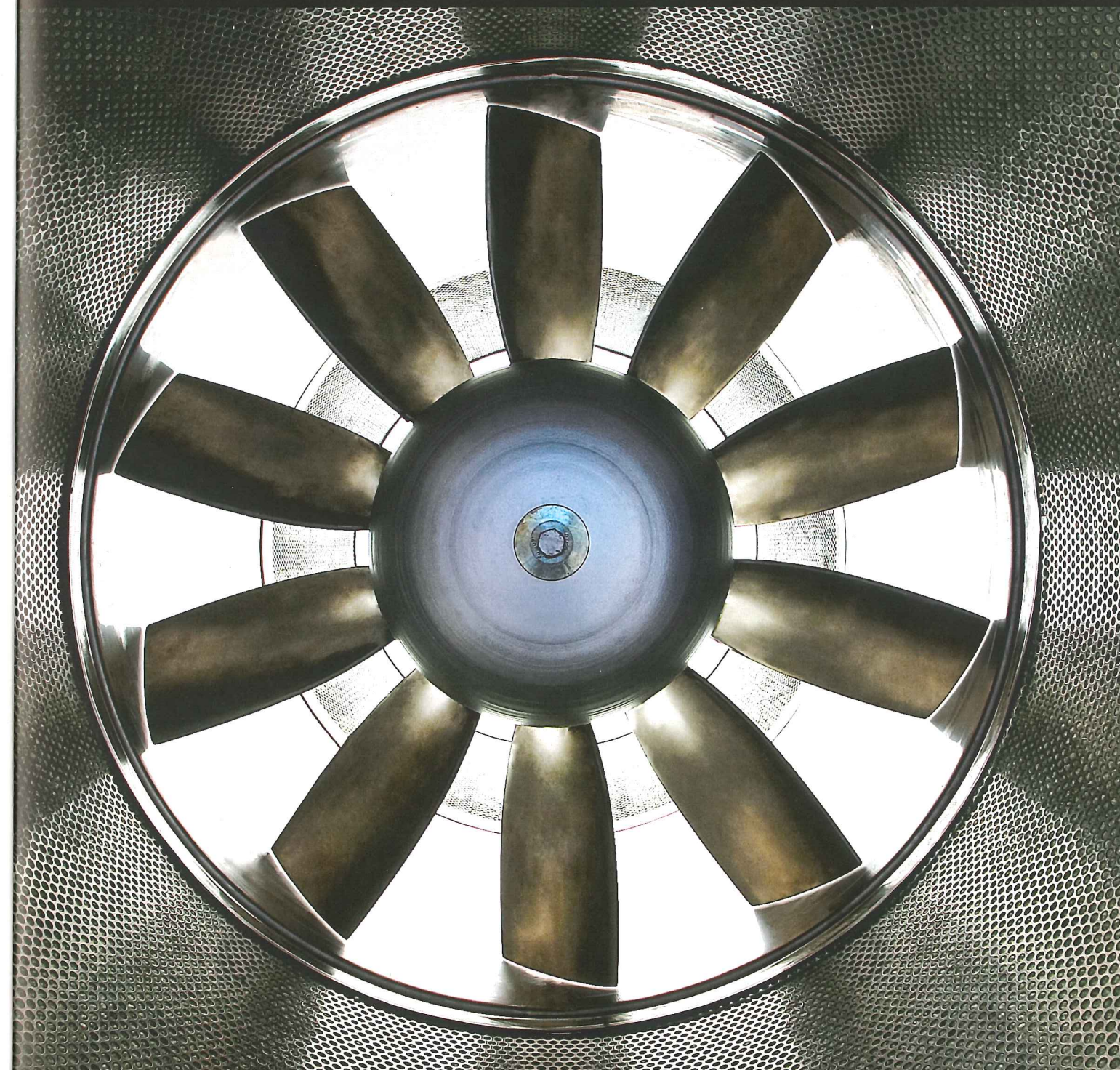
# EUROPE

The ageing cities of the European continent always have a strong demand for underground solutions to the challenges of highly urbanised populations, London in particular has an impressive pipeline of work

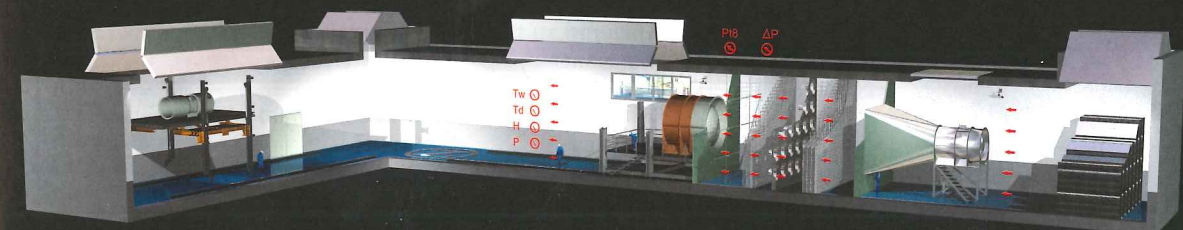


## Key

- |   |   |   |
|---|---|---|
| 1. Eurasia Tunnel                         | 18. Stockholm City Line                         | 35. Wendlingen to Ulm High-Speed Railway Line |
| 2. Marmaray Upgrade                       | 19. Koralm Tunnel                               | 36. S2 Expressway Pulawska to Lubelska        |
| 3. Uskudar-Sancaktepe Metro Tunnel        | 20. Zurich Cross-City Link                      | 37. Milan Metro                               |
| 4. Lyon-Turin base tunnel                 | 21. Bucharest Metro                             | 38. Karlsruhe rail tunnel                     |
| 5. Crossrail 1                            | 22. Lansimetro                                  | 39. Corinth-Tripoli-Kalamata Motorway Upgrade |
| 6. Barcelona Metro                        | 23. Maliakos Bay to Kleidi Motorway             | 40. Victoria Station Upgrade                  |
| 7. Brenner base tunnel                    | 24. Ceneri base tunnel                          | 41. Eppenberg tunnel                          |
| 8. Rome Metro                             | 25. Paris Metro                                 | 42. Bank Station Capacity Upgrade             |
| 9. Fehmarnbelt                            | 26. Rennes Metro                                | 43. Rastatt Tunnel                            |
| 10. Stuttgart 21                          | 27. Limmern hydropower plant                    | 44. Berlin U5                                 |
| 11. Belgrade to Bar Motorway tunnel       | 28. London Power Tunnels                        | 45. Attiko Metro Line 3 Extension             |
| 12. Thames Tideway                        | 29. Northern Line Extension                     | 46. Alpaslan hydropower project               |
| 13. Pedemontana Lombarda Motorway Upgrade | 30. European X-Ray Laser XFEL Tunnel            | 47. Farringdon Station Development            |
| 14. Warsaw Metro                          | 31. Sofia Metro Development                     | 48. Struma Motorway                           |
| 15. Thessaloniki Metro                    | 32. Nant de Drance Pumped Storage               | 49. A4 Motorway-Marão Tunnel                  |
| 16. Amsterdam Noord/Zuidlijn Metro Line   | 33. A15 Maasvlakte to Vaanplein Highway Upgrade | 50. E6 Ringebu to Otta Road: Frya to Vinstra  |
| 17. Semmering base tunnel                 | 34. Kungens Kurva to Haggvik Bypass             |   |



The legend in ventilation systems

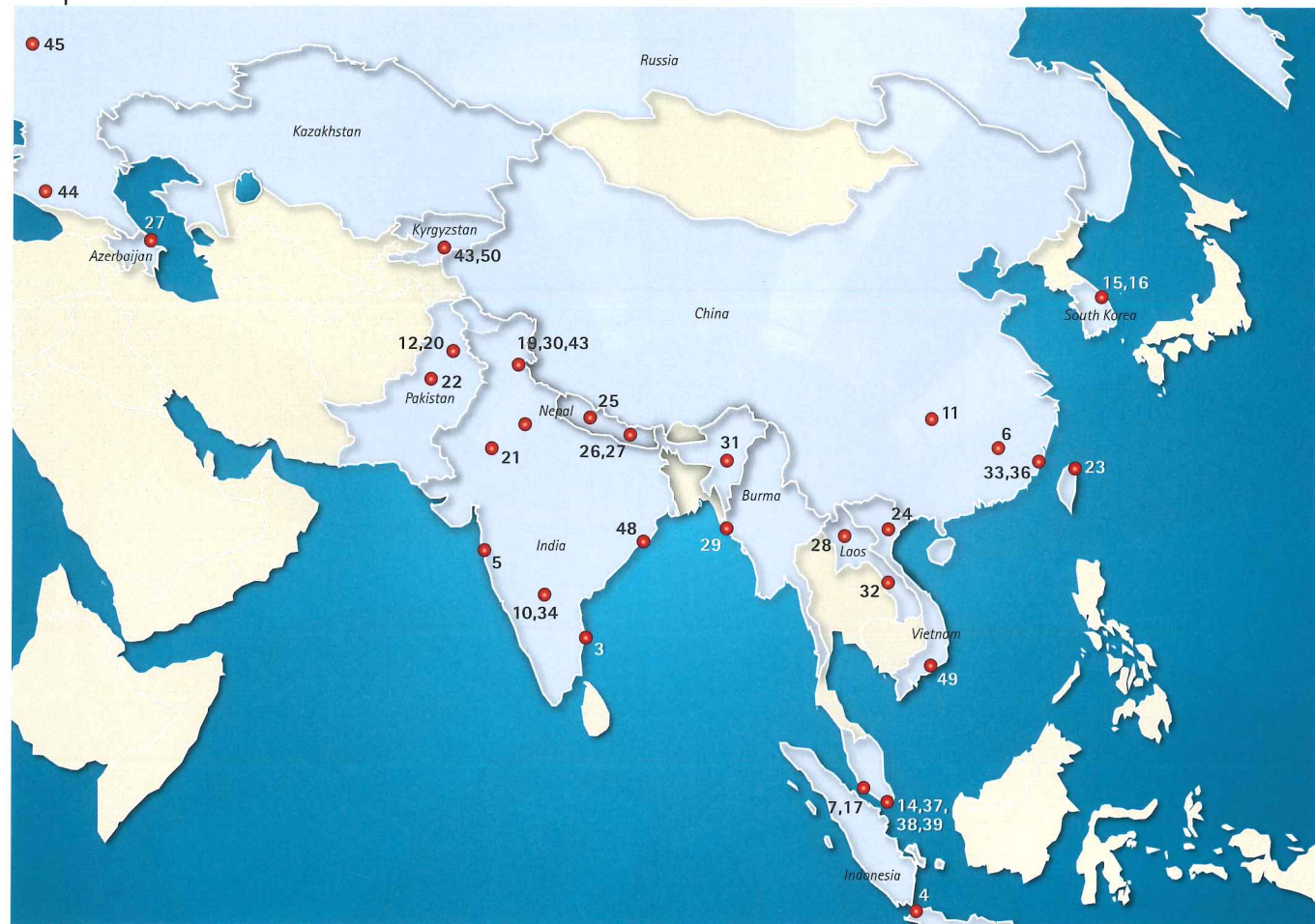


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# ASIA

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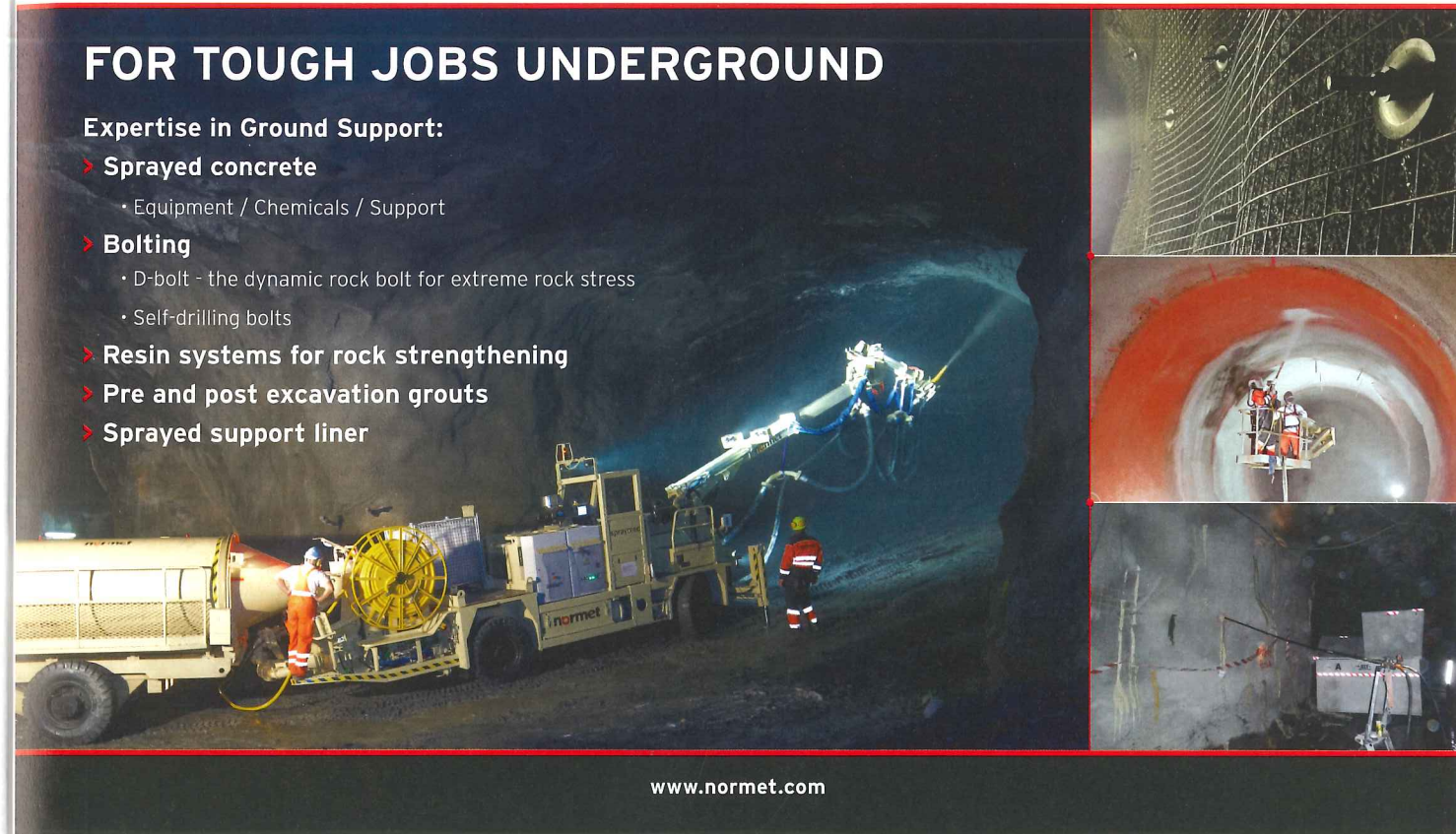
### Key

- |  |  |   |
|--|--|---|
| 1. Shatin to Central Link                  | 19. Jangi-Thopan-Powari hydropower plant     | 36. Xiamen-Haicang Undersea Tunnel                  |
| 2. Hong Kong Zhuhai Macao Bridge Tunnel    | 20. Kashmir Railway Line                     | 37. Singapore cable tunnels                         |
| 3. Chennai Metro                           | 21. Rawatbhata Nuclear Power Plant Expansion | 38. Sentosa Gateway Tunnel                          |
| 4. Jakarta MRT                             | 22. Subansiri Lower hydropower plant         | 39. Deep Tunnel Sewerage System 2                   |
| 5. Mumbai Metro                            | 23. Suhua Highway Upgrade                    | 40. Delhi Metro                                     |
| 6. Nanchang-Ganzhou Railway Line           | 24. Hanoi Metro                              | 41. Kai Tak Redevelopment                           |
| 7. Klang Valley MRT                        | 25. Teesta Stage III hydropower plant        | 42. Bishkek-Osh Second Highway Development          |
| 8. Hong Kong Express Rail Link             | 26. Kathmandu Expressway                     | 43. Vishnugad Pipalkoti hydropower project          |
| 9. Tuen Mun to Chek Lap Kok Link           | 27. Baku to Tbilisi HSR tunnels              | 44. Nenskra hydropower project                      |
| 10. Bangalore Metro                        | 28. Nam Ngum III Hydroelectric               | 45. Moscow Metro                                    |
| 11. Chongqing Rail Loop Line               | 29. Karnaphuli Tunnel                        | 46. Upper Marsyangdi II hydropower project          |
| 12. Neelum Jhelum Hydropower Plant         | 30. Parbati Hydropower Plant                 | 47. Liantang/Heung Yuen Wai-Sha Tau Kok Interchange |
| 13. Central Wan Chai Bypass                | 31. Jiribam-Imphal Rail Line                 | 48. Kolkata Metro                                   |
| 14. Thomson Line                           | 32. Xe-Pian Xe-Namnoy hydropower plant       | 49. Lower Se San II Hydropower Plant                |
| 15. Pyeongchang Tunnel                     | 33. Shantou Bay Cross Sea Tunnel             | 50. North South Alternative Road                    |
| 16. Daekwanryong Tunnel                    | 34. Srisaillam Left Bank Canal Tunnel        |   |
| 17. Sungai Buloh to Kajang MRT Line        | 35. South Island Line                        |   |
| 18. Taipa Light Transit System Development |  |   |

## FOR TOUGH JOBS UNDERGROUND

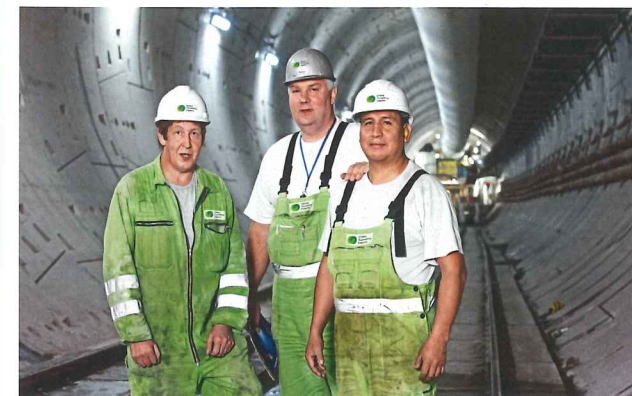
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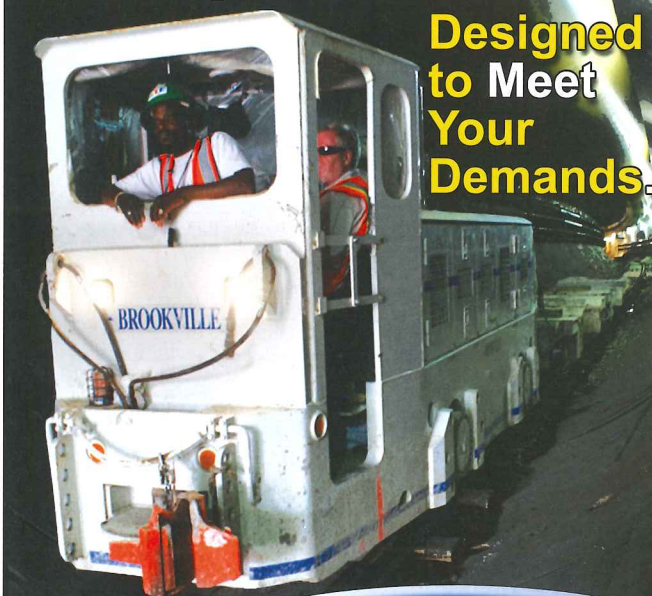
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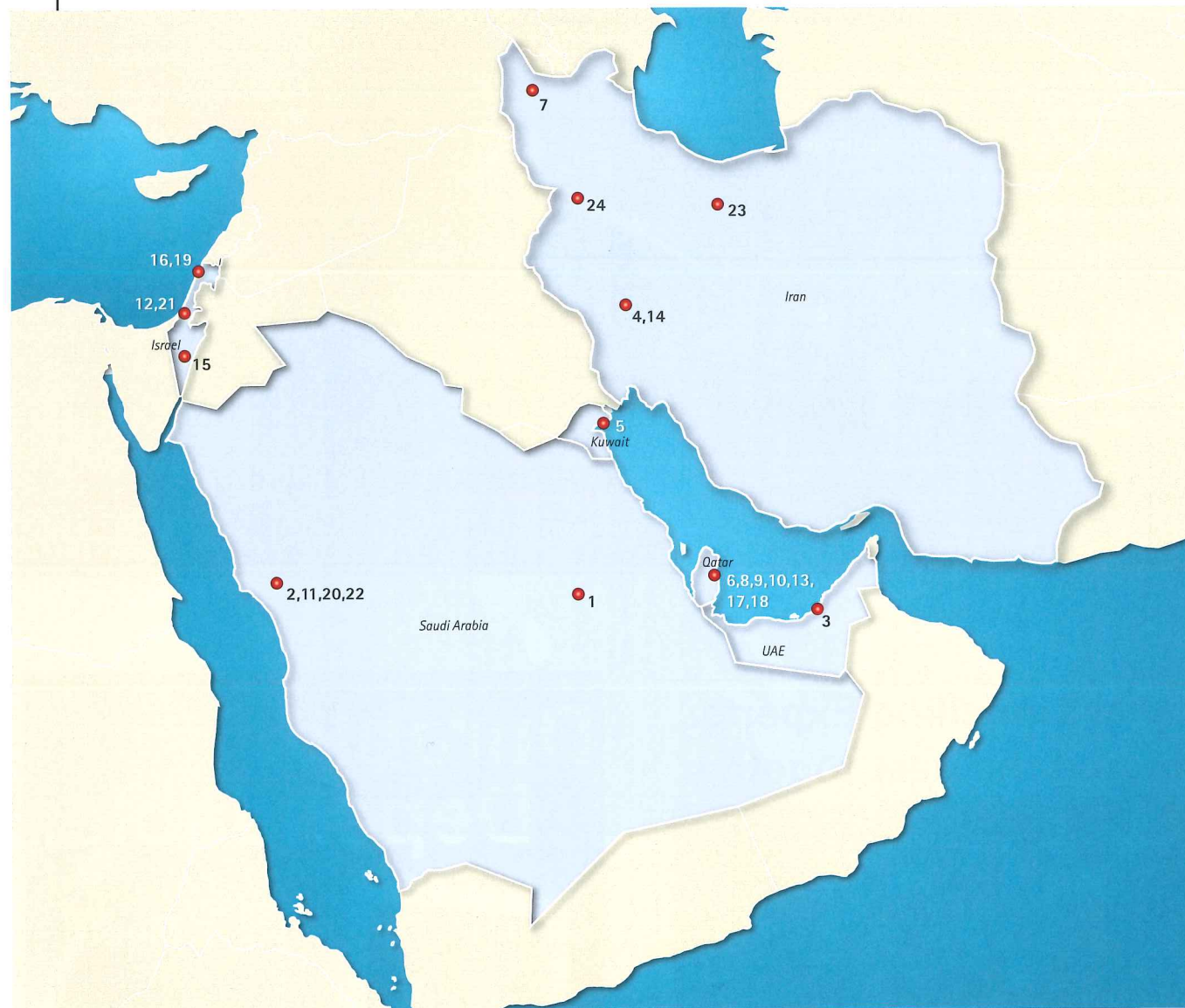


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# MIDDLE EAST

Although projects are not numerous, the level of investment in areas is world-beating



## Key

- |   |  |
|---|--|
| 1. Riyadh Metro   | 13. Al Muntazah Road Extension                           |
| 2. Prince Majed and Old Mecca Road Bridge and Tunnel              | 14. Azad hydropower project                              |
| 3. Strategic Tunnel Enhancement Programme                         | 15. The Fifth Water System to Jerusalem: Eastern Section |
| 4. Bakhtiari hydropower project                                   | 16. Beirut Water Supply Scheme                           |
| 5. Kuwait Airport Tunnel  | 17. Doha Storm Water Drainage Tunnel                     |
| 6. Inner Doha Resewerage Integrated System                        | 18. Al Khor Sewerage Development                         |
| 7. Aras hydropower project  | 19. Jal El Dib Bridge Replacement                        |
| 8. Al Khor-Al Ruwais Road Tunnels                                 | 20. Haramain High Speed Rail tunnels                     |
| 9. Doha New Orbital Highway                                       | 21. Tel Aviv Light Rail System                           |
| 10. Doha Metro  | 22. Jeddah Metro   |
| 11. King Abdulaziz-Palestine-Al-Hamra Streets Intersection Tunnel | 23. Tehran Metro   |
| 12. Akko to Karmiel Railway Line tunnels                          | 24. Tabriz Metro   |
|   | 25. Mashhad Urban Rail project                           |

Infrastructure



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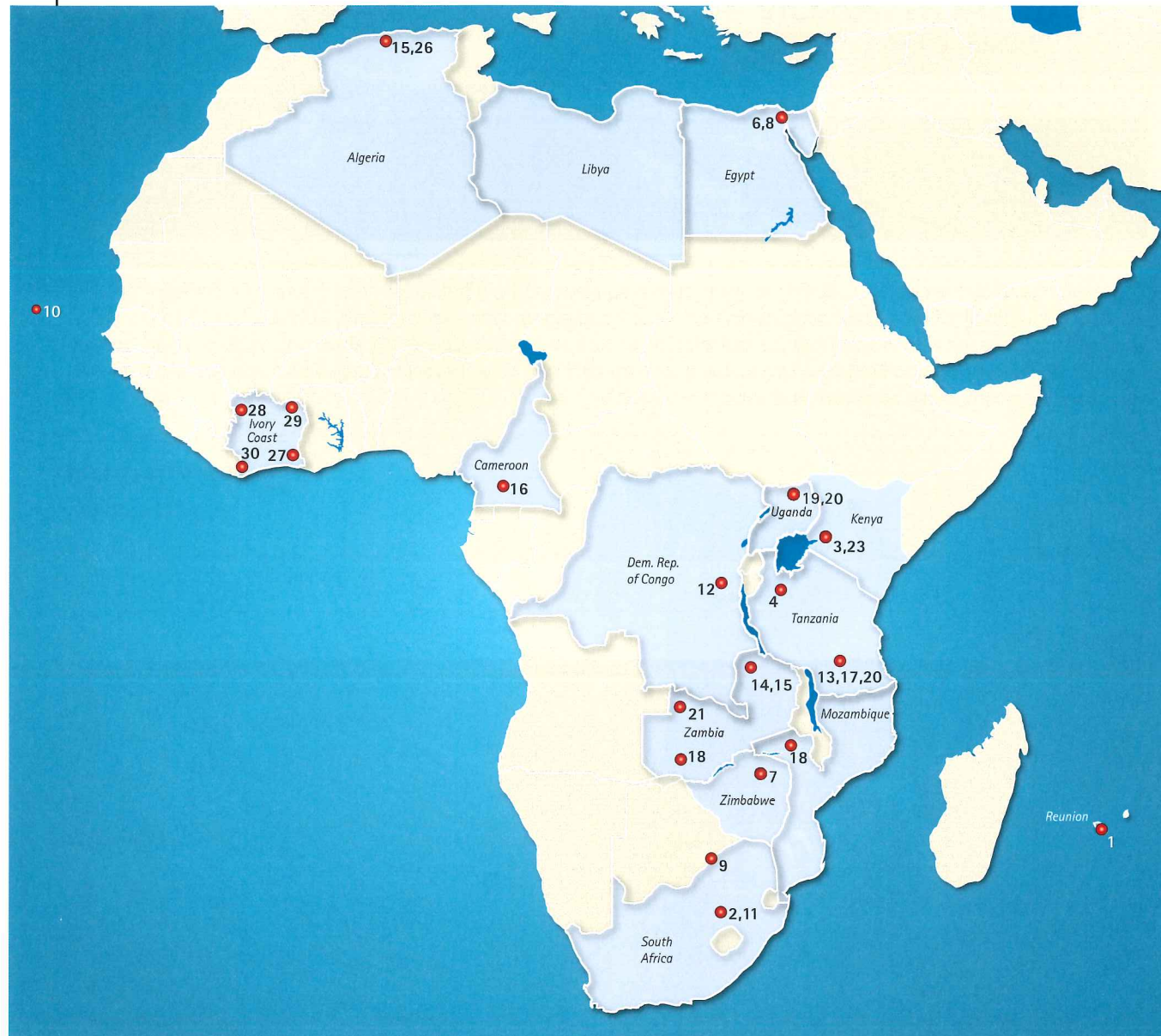
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# AFRICA

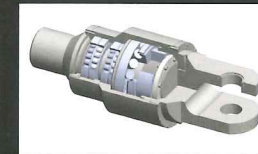
A snapshot of tunnelling in Africa, the majority share of the work being hydropower



### Key

- |   |                                       |                                    |
|---|---------------------------------------|------------------------------------|
| 1. Route du Littoral Coastal Highway          | 10. Covoada Road Tunnel               | 21. Kabompo Gorge hydropower plant |
| 2. Ingula Pumped Storage Plant                | 11. Polihali Dam tunnels              | 22. Mphanda Nkuwa hydropower plant |
| 3. Itare Dam Development                      | 12. Rusizi hydropower plant           | 23. Rusumo Falls hydropower plant  |
| 4. Rusumo Falls Hydropower Plant 80MW         | 13. Ruhudji hydropower plant          | 24. Rumakali hydropower plant      |
| 5. Ahnif Road Connection                      | 14. Kabwelume hydropower plant        | 25. Souk Al Juma sewer system      |
| 6. Suez Canal Tunnels                         | 15. Kundabwika hydropower plant       | 26. Algiers Metro expansion        |
| 7. Kunzvi Dam Development                     | 16. Lom Pangar hydropower plant       | 27. Bandama hydropower plant       |
| 8. Cairo Metro Expansion                      | 17. Stiegler's Gorge hydropower plant | 28. Sassandra hydropower plant     |
| 9. Mokolo Water Augmentation Facility tunnels | 18. Kariba south hydropower plant     | 29. Comoe hydropower plant         |
|   | 19. Karuma hydropower plant           | 30. Cavally hydropower plant       |
|   | 20. Isimba hydropower plant           |                                    |

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# AUSTRALASIA

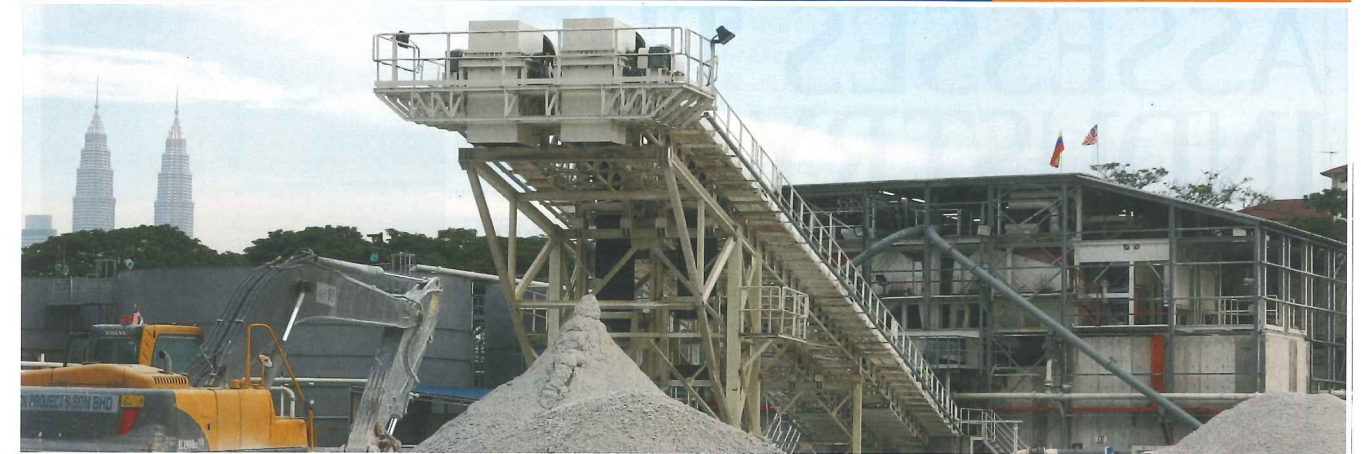
The southern continent is not just girt with sea. An array of tunnelling projects line the coast of Australia, providing much needed relief for transport bottlenecks, and also some water supply infrastructure



## Key

- |   |   |
|---|---|
| 1. WestConnex motorway schemes                  | 12. O-Bahn Tunnel Development                       |
| 2. Sydney North West Rail Link                  | 13. Majura Parkway                                  |
| 3. Grosvenor Mine expansion project             | 14. Canberra Light Rail Development                 |
| 4. Barangaroo Wynyard Station Pedestrian Tunnel | 15. Melbourne Metro                                 |
| 5. Forrestfield to Airport Link                 | 16. Tintenbar to Ewingsdale Pacific Highway Upgrade |
| 6. Perth Freight Link upgrade                   | 17. Bunbury outer ring road                         |
| 7. Waterview Connection project                 | 18. BaT Project                                     |
| 8. Perth City Rail and Bus Link                 | 19. Mount Victoria Tunnel upgrade                   |
| 9. St Helena Road Tunnel                        | 20. Toowomba Range tunnel                           |
| 10. City East Cable Tunnel                      | 21. Ruahine Street and Wellington Road Upgrade      |
| 11. Rajamandala Hydropower Plant                | 22. Waitemata Harbour Crossing                      |

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**TEC** Tunnel Engineering Consultants



Tunnel Engineering Consultants (TEC), is a permanent joint venture partnership between leading consultants Royal HaskoningDHV and Witteveen+Bos. TEC combines knowledge, expertise and experience of the mother companies (of approx 8,000 professionals) within the field of large underground projects.

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# CH2M BOSS ASSESSES THE INDUSTRY

Martin Knights, managing director of CH2M's tunnels and earth engineering practice praises the increasing profile and technical acumen of the tunnelling industry



**Above, right:** Martin Knights is the managing director of CH2M's tunnels and earth engineering practice

**Below:** One of CH2M's foul water tunnel projects using synthetic interior lining

LONDON MUST be the sustained capital of tunnelling says CH2M director Martin Knights. "Apart perhaps for China, Singapore and perhaps Hong Kong, I do not see an area of the world where clients have the same confidence, the same funding, or see as clearly the need to continue to invest in major infrastructure projects, especially underground infrastructure

"A lot of competitor cities are going to be looking at the way London does things; the way it has managed to get the private sector invested in programmes of public works. They realise that we need to get people into and out of the capital efficiently, and that lasting benefits to quality of life only help the city."

It is of course the politicians that drive these projects, and even the largest scheme is at the mercy of state whims, but repeated successes for the industry breed confidence, and a more reliable pipeline. This is key says Knights, as it allows the industry to invest with a

degree of confidence .

"When the industry can recruit people, and train them, as I currently am and have the confidence to do," says Knights, "there is a surge in confidence and innovation. If you look 20 or 30 years ago, when the industry was stop-start, it is no wonder tunnelling was conservative; no wonder that nobody wanted to invest. We would wait for the next large-scale project to arrive and would provide the same old solutions."

## LASTING RENAISSANCE

This confidence in the pipeline allows for more certainty in future planning. Using the UK as an example again; there is currently a minor lull in British work, a gap between site work in the immediate aftermath of Crossrail. However, CH2M has been recruiting on an investment basis.

"There are large programmes of work that require detailed planning, design and engineering from our Practice, as well as construction management requirements I can see the significant pipeline as well, and recruit for the present and the future. There are a lot of good people around at the moment, and investing in their skills is good business for what is coming. If that is taking advantage of the current market, then I am happy because I will be ready for the future."

The CH2M tunnelling and civil engineering division is about 600 strong. Knights describes it as not unlike a rugby team in effect, recruiting and training good people, mentoring and



developing them, and moving them in and out of projects and among business groups that need the resource. On that basis an enduring pool of skilled staff is required, rather than hiring and firing as contracts dictate.

Knights elaborates: "I run a Practice and it's all about managing talent and excellence with cost, and that is how I would like to be measured. Most of all I care about service to the business groups: water, transportation, energy, who win, own and deliver projects because of our skills. Being able to successfully recruit so we have people ready to be deployed on big projects; providing career development so people are being mentored and there is a healthy succession plan within the group.

## ENGINEERING DNA

"The other thing is to nurture the excellence of the historic tunnelling legacy that Halcrow was noted for," says Knights. "CH2M bought Halcrow in 2011, largely because of its technology and engineering capabilities. Also a lot of our underground projects are located in urban areas and is highly complex. A strong engineering DNA."

Sometimes CH2M is perceived as a 'just programme manager'. This is perhaps a residual effect of the work CH2M started doing in the 1950s and 1960s, a period when a lot of US cities did not have the capability to run large programmes of work. CH2M stepped into this role and became known for its work as a supporting arm of clients.

"But the beating heart of the company is this engineering, science, planning, and environmental heritage," says Knights, "so when we take on the large scale programmes, they are undertaken with the heart and soul of engineering and science as a basis. There is an excellent technical side and capability within the company."

## TEAM PLAYER

On this point, more and more of the world's major infrastructure programmes are placing emphasis on an underground component. This, by its nature, is hugely complex and technical work, and client confidence in a consultancy is absolutely critical. Although the Tunnels and Earth Engineering Practice at CH2M is only 600 people out of a total 26,000, it has increased significance in allowing CH2M to get into urban programmes where these skills will be essential.

"We are very significant to the wider business," says Knights, "the depth and range that CH2M acquired with the Halcrow legacy, which when added to the legacy CH2M Tunnelling capability, strengthens assertions to clients that they understand the programmes that they are managing. It gives authority to the general delivery of projects."

## LOOKING TO THE FUTURE

As for the future, CH2M is looking at technologies that will be emerging over the next five years. The industry is encouraged to innovate, "but what is innovation?" asks Knights. Industry must try to recognise when a good idea becomes an innovation, and how to spot technology trends that are coming up in the future.

Occupying the minds of recruiters is who to employ and what skills are needed, as well as which university courses or government-sponsored research establishments to invest in. These are judged on whether they are sharing or promoting technical solutions that might affect underground structures over the next five to 10 years.

CH2M for example is co-investing with Cambridge University and other like minded companies in the Smart Infrastructure Programme, and also research on geopolymer

## A selection of CH2M projects

- UK - Crossrail, as project and delivery partner
- USA - Los Angeles Purple Line, as designer to Skanska-Traylor Bros.
- UK - High Speed Rail 2 Project, as a programme manager supporting the client
- Argentina - Buenos Aires/Rio de la Plata outfall and re-sewerage projects, with Impregilo and Ghella
- UAE - mountain road access to the coast, working with ministry client
- India - Kashmir hydropower tunnelling/caverns with client NHPC and contractor HCC
- USA - Blue Plains combined sewer overflow tunnels/shafts working with Traylor Brothers
- Australia - Sydney North West Rail Link, as designer to John Holland-Thiess
- Qatar - the Inner-Doha Re-Sewerage tunnels/shafts Implementation Strategy
- UAE - the Strategic Tunnel Enhancement Programme (STEP) in Abu Dhabi
- UK - Thames Tideway and Lee Tunnels, as programme manager
- Hong Kong - Express Rail Link tunnels

segments at Victoria University in Melbourne, Australia.

"If you talk to a pure technologist," says Knights, "they will say it (innovation) is all about improving material science and developing effective design processes. But innovation can take many forms. A lot of it can be around logistics, or procurement, or even the way client culture permeates projects. Bank Station in London has been groundbreaking in client approach and is all down to the confidence London Underground has, and hopefully other clients can pick this up. Finally, innovation can come from challenging design codes. If you can get past the lawyers."

## FINAL THOUGHTS

Knights concludes: "I would just like to reiterate that there is a steady pipeline of work for the next 10-15 years, particularly in London. The success of tunnelling in the UK's capital has attracted more talent into the industry. Crossrail has been in the papers for the right reasons and not the wrong reasons, and the recent BBC documentary shows we are not just men with wheelbarrows.

"Politicians are enthusiastic, there is a new confidence in underground space that is all down to being safe, while delivering on-time and on-budget.

"That is the difference, the big change that has happened in tunnelling over the last decade. It has raised its image by attending to the simple things, and has effectively been able to communicate that"

# INTRODUCING OPTIMAS AND THE SOFRASAR TUNNEL LEGACY

The Underground Construction Market Benefits from *Optimas*, Trusted Distributor and Manufacturer of Highly Engineered Fastenings

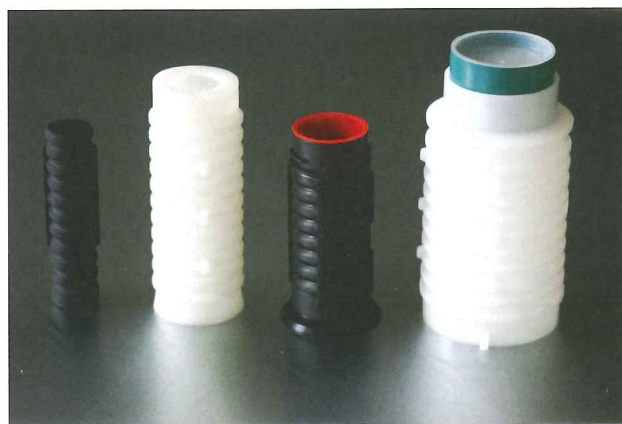
IN JUNE 2015 Optimas OE Solutions, which specialises in the distribution and manufacturing of highly engineered fasteners and C-Class components, became an independent company. Formerly the OEM Supply - Fasteners division of Anixter Inc., Optimas was acquired by American Industrial Partners (AIP), a middle-market private equity firm focused on acquiring and improving North American-headquartered industrial businesses.

As an independent company, Optimas are now able to leverage their robust industry presence and expertise, along with the AIP partnership, to forge stronger relationships with existing and potential customers in the tunnel, commercial vehicle, luxury automotive, agricultural equipment, power generation equipment, construction and general industrial markets.

"Optimas is committed to providing supply chain solutions for our OEM customers that allow them to focus on the bigger picture rather than the minutia of the day to day. Supported by the deep operating and industry expertise of AIP, we are now able to help our customers excel in ways previously unachievable" said Ian Clarke, Chief Executive Officer of Optimas.

The Optimas team - which includes nearly 2,000 experts throughout the Americas, Europe and Asia - consists of seasoned and respected industry leaders, bringing over 8 decades of experience to

Below: Bolt socket (far left) and grout-lift sockets provided by Optimas



the table. Strengths include an ability to bridge the gaps between engineers, suppliers and OEM customers, while ensuring that each customer experiences the highest calibre of quality and service, wherever they are in the world.

## VERTICAL INTEGRATION BRINGS SUPPLY CHAIN ASSURANCE

In November 2015, Optimas announced the acquisition of Barton Cold-Form, a UK-based manufacturer of critical cold form fasteners and components. Formed 80 years ago, Barton is one of Europe's oldest and leading manufacturers of critical fastenings and special cold forgings. Barton is a long a trusted partner to the automotive supply chain - including major luxury automotive manufacturers and their tier suppliers. Barton's 5,500sq.ft (510sq.m) ISO/TS 16949 accredited facility in Droitwich, near Birmingham UK, adds value through not only expertise but also a comprehensive range of capabilities. Barton's vertical and technology integration into Optimas brings increased assurance to the supply chain for both businesses' regional customers.

The Optimas acquisition of Barton is estimated to increase their already existing ISO and TS certified manufacturing footprint. The North American facility in Wood Dale, Illinois has seen investments ranging from additional machines to the calibre of human capital. All aimed at optimising operations, increasing capabilities and efficiency to better serve customers.

This is just a recent and visible example of Optimas' commitment to their global footprint and a lively investment strategy. They will likely showcase more of their strategic investment agenda in 2016.

## GROWING SUPPLIER PARTNERSHIPS

Mike Tuffy, Senior Vice President, Procurement at Optimas, highlights how the acquisition of Barton is part of a broader sourcing strategy. "Manufacturing is an important part of our value proposition but it will not detract from the strategic supply partnerships we are now working hard to forge. Optimas will undoubtedly invest to develop Barton. It will remain a specialised plant with high added value capabilities, which we have to use selectively and to maximum effect."

Tuffy reinforces his ongoing message shared with the Optimas supplier base, which outlines that other suppliers will gain from the development. "This is one of a number of initiatives to drive Optimas' growth. The ultimate benefit to the strategic supply partners that engage wholeheartedly with Optimas will be to win their share of that overall growth."

## STRATEGY UNDERWAY FOR 2016

Optimas CEO, Ian Clarke, is enthusiastically confident when it comes to the investment partnership that helped launch Optimas as a standalone business. "In very short order AIP

## A tunneller's view: Christophe Delus with Optimas' Tunnel Division

Christophe Delus, account manager for Optimas' Sofrasar Tunnel Products range, has been with the industry for over 15 years. He spoke to Tunnels and Tunnelling to clarify what customers in the underground construction industry need to know.

"We provide, and will continue to be known in the industry by our product branding. 'Sofrasar' is still here and continues to supply a full assortment of accessories for segment linkage and grouting (except gaskets)," Delus affirms. He continues, "our customers continue to rely on us to consistently manage the fundamental things beyond just the parts, to help them excel wherever they are in the world."

Sofrasar was the original name of the company, before it was bought out by Anixter OEM Supply - Fasteners in 2008. Then the fasteners division separated from Anixter in mid 2015 and became Optimas. Over the last 15 years, the underground construction industry has developed considerably. The municipalities have a lack of space and when a new transportation network is required, most of the time the underground solution is chosen. Also the excavation technology has evolved and nowadays the size of the tunnels has almost no limit. The continuous development of this industry has meant that the accessories and fasteners have also evolved with this trend. 25 years ago, the products used to link the segments within a tunnel were not specific to this industry. Now for each project a specific solution is developed or studied by the Optimas Sofrasar Tunnel Products team to ensure the fasteners are fit for their purpose.

With the transition to Optimas, the tunnel division is able to continue its investment and development of new solutions. The team has always been known for its responsiveness, its technical leadership and its ability to develop specific solution for each project. For each single project, our team is at our customer's side to discuss all of their requirements thoroughly and to propose the best technical/economical solution to meet these needs. If required, Optimas can partner with customers to support the development a new product or make one of the existing products evolve to match customer expectations.

## INFRASTRUCTURE PROJECT SPECIALISTS

For over 20 years, tunnel infrastructure project owners around the world have trusted Sofrasar for their fastener solutions - from dowel, bolting and injection systems to anchors and accessories. The group's global distribution network and supply chain expertise have delivered a variety of solutions for this highly specialized form of construction. Sofrasar focuses on providing sound, efficient solutions while working in partnership with civil engineering, university, material research and laboratory experts to offer solutions meeting the highest global standards.

Sofrasar can develop new products or improve on existing products to solve specific challenges that emerge during the design and implementation phases of any tunnelling project. Some solutions range from bespoke mould technology to

arrangements for the permanent control of quality in production.

Small fasteners and components are fundamental to underground construction projects. However, a clear understanding of the potential challenges and opportunities for each particular project, and the speed with which solutions are recommended, play a very important role in the success of any tunnelling project.

"Through our close partnerships, we understand that the market operates heavily on price as a differentiator," says Delus. "But with customers who have very strict and technical requirements, we partner with them before the design has been finalised. This is where we excel not only in collaboration but building in cost savings and efficiencies hand-in-hand with the engineers."

## RESEARCHING TOMORROW'S SOLUTIONS, TODAY

Optimas is known for the high specification of its products, according to Delus, and invests resources into research and development. "We do not put out a new product or development every year; instead one of our key strengths is to adapt the product to the project, and to the needs of the customer."

He gives an example: "We partnered with a customer to develop a range of shear cones (or shear dowels). The application required the ability to join one ring to another under very high pressure to ensure strength and alignment of gaskets. These are typically used across passages and for large diameter applications to support the ring with minimal movement."

"While we cannot predict the future, when it comes to segmental tunnel linings, we ensure a high-quality, high-performance fastening solution and, importantly, a safe ring build. We have seen over the last few years an increased use of dowels; for infrastructure projects, including transportation tunnels and urban development, while previously they may have just been used for utilities."

## STRONG MARKET PLAYERS

"Underground construction is still booming and we are still seeing investments globally. We have large projects in Europe, South America, and the Middle East. Singapore specifically, we have observed steady growth for more than 15 years now."

Tunnel infrastructure building is a highly specialised industry. For over 20 years tunnel infrastructure managers have come to trust Optimas' Sofrasar Tunnel Product team for their reliable fastener solutions - from dowel, bolting, and injection systems to anchors and accessories. Delus closes the interview saying, "Underpinned by our goal to enable our customers to excel, our tunnel experts seek to first understand our customers' needs then we can support them with the appropriate and tailored mix of: engineering design support, quality control processes and prototypes, and logistics solutions."

has demonstrated tangible, incisive support, evidenced by this acquisition." He continues, "behind the scenes we have been able to make game changing investments in technology and systems to build on our integrated, global capabilities as an OE solution provider."

Where next for Optimas? Although no one will talk specifics, these investments in manufacturing show a significant shoring up of competitive advantage and are recognised as a real differentiator by industry insiders. The Barton acquisition may signal the intention to replicate those advantages in every major continent

where Optimas is active.

In an increasingly complex macroeconomic environment, Optimas may be looking beyond organic growth - does this imply that they will not be long in turning their attention to increased market penetration through targeted distribution acquisition? The trick, as was the case with manufacturing, will be to find the right, available partners



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# CONTRACTORS

The alphabetical list of contractors in the tunnelling industry,  
as collected by the *Tunnels and Tunnelling* survey

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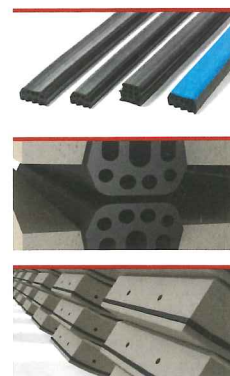
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Company and contact information	Number of employees		Annual turnover USD (M)	Tunnel turnover USD (M)	Regions company works in							Specialist areas	Company profile	
	Total	In tunnelling			Africa	Asia	Australasia	Europe	Middle East	North America	South America			
<p>Advanced Marine 1 Gul Street 4 Jurong Singapore 629233 Republic of Singapore admar@advanced-marine.com.sg +65 6265 8122</p> <p>Primary Contact Jeff Bradford Managing Director</p>	52	12	12	2		✓	✓						Medical Lock design/ manufacture/ servicing/ sale/rental/ operators, Compressed Air training & audits	Established in 1979 and celebrating over 35 years of service, Advanced Marine is South East Asia's leading supplier of all types of Commercial Diving, Survey, ROV and Subsea Equipment. We design and manufacture a diverse range of equipment including Decompression and Hyperbaric Chambers, L.P. and H.P. Divers Air Compressor, Gas and Depth Control Panel, Helium Gas Recovery System, Environmental Control Unit, Viewports and Custom built requirements. We have designed and produced up to 1,454 products as of 2015 including Medical / Man locks for 15 projects in Singapore. Our Survey section includes ROV's and ancillary equipment, Underwater Modems and Tracking Systems, Cables, Connectors and Sliprings. Our Slogan is "The Total Service Company", providing Consultation, PVHO and Dive System Engineering, AutoCAD/3D Drawings, Solid Works Stress Analysis, Sales, Rental and Back-up Service.
<p>Avancia Engineering Enterprises 201-GTH Building -Al Salam St. Abu Dhabi-UAE avancia@avancia.ae +97126222534</p> <p>Primary Contact Asem Abdelrazeq Sales and marketing Manager</p>	10	10							✓				Fire Protection solutions for Road, Rail and Metro Tunnels as per Rijkswaterstaat, RWS Curve	<p>Road Tunnels</p> <ul style="list-style-type: none"> <li>-Al Salam Street Tunnel in Abu Dhabi, U.A.E.</li> <li>-Bypass M-30 Tunnel in Madrid, Spain</li> <li>-Al Ras Al Akhdar Tunnel in Abu Dhabi, U.A.E.</li> <li>-Baynoonah Street Tunnel in Abu Dhabi, U.A.E.</li> <li>-Marina Coastal 482 Tunnel in, Singapore</li> </ul> <p>Tunnels and underground stations</p> <ul style="list-style-type: none"> <li>-Barcelona's Underground Barcelona, Spain</li> <li>-Malaga Underground Malaga, Spain</li> <li>-T4 Local Train Station in Madrid, Spain</li> <li>-Metrosur Tunnel in Madrid Spain</li> </ul> <p>Airport</p> <ul style="list-style-type: none"> <li>-Midfield Terminal Tunnel in Abu Dhabi, U.A.E.</li> <li>-Al Etihad International Airport in Abu Dhabi, U.A.E.</li> </ul> <p>Other Tunnels</p> <ul style="list-style-type: none"> <li>- Football Stadium, New entrance Tunnel, U.A.E.</li> </ul>
<p>Balfour Beatty Balfour Beatty 130 Wilton Road London SW1V 1LQ csuk@balfourbeatty.com +4420 7216 6800</p> <p>Primary contact Paul Hoyland Director of Tunnelling</p>	9800	100			✓	✓	✓	✓	✓	✓	✓		<p>Sprayed concrete lining, shaft sinking, tunnel M&amp;E systems, segmental linings.</p> <p>Balfour Beatty delivers major tunnelling and underground construction projects in the transportation, power and water sectors with capabilities in design, materials testing and technology, repair and refurbishment, ground engineering, shaft sinking, mechanised tunnelling, sprayed concrete linings, rail infrastructure, power systems and M&amp;E installations.</p> <p>Recent successful projects include the A3 Hindhead road tunnel in Surrey and the platform and ancillary tunnels at Whitechapel and Liverpool Street Stations as part of the Crossrail project.</p>	



Company and contact information	Number of employees		Annual turnover USD (M)	Tunnel turnover USD (M)	Regions company works in							Specialist areas	Company profile
	Total	In tunnelling			Africa	Asia	Australasia	Europe	Middle East	North America	South America		
<p>BBM doo Niederlassung Mülheim/Ruhr Dieter aus dem Siepen Platz 1 45468 Mülheim/Ruhr Deutschland info@operta-bbm.de +49208 459590</p> <p>Primary contact Frank Gerlitzki Sales Manager</p>	1000	50			✓	✓	✓	✓	✓	✓	✓	Contracting, equipment manufacturing	Contracting in mining, tunneling and civil engineering. Manufacturing of roadheaders and other tunnelling and mining excavation equipment
<p>BeMo Tunnelling Bernhard-Hoefel-Strasse 11 6020 Innsbruck Austria office@bemo.net +435123311433</p> <p>Primary contact Josef Arnold Managing Director (CEO)</p>	365	365			✓	✓	✓	✓	✓	✓	✓	NATM, SEM, SCL, Scandinavian Method, TBM, special foundation works	<p>BeMo is a specialist in the engineering and construction of all kinds of underground structures, whether new construction, refurbishment, reinstatement or reconstruction.</p> <ul style="list-style-type: none"> <li>- Underground Construction &amp; Tunnelling</li> <li>- Special Foundation Engineering</li> <li>- Know-how Transfer &amp; Consulting</li> <li>- Design for Tunnels and Underground Structures</li> <li>- Tunnel Survey &amp; Geotechnical Measurements for Tunnelling</li> </ul> <p>State-of-the-art technology for all types of ground</p> <p>Our highly qualified and committed team of experts is known internationally for its broad scope of technical competence and innovative solutions for the design and delivery of complex and challenging tunnel works.</p> <p>NATM, SCL, SEM, Scandinavian Method, TBM-Tunnelling</p> <p>Certifications: ISO 9001 + ISO 14001 + OHSAS 18001 and SCC**</p> <p>Recent projects: Crossrail C510, London, UK Metro Stadtbahntunnelk, Karlsruhe, Germany</p>
<p>BESSAC ZI de la Pointe 31790 Saint Jory France csmbessac@csmbessac.com +33 5 61 37 63 63</p> <p>Primary Contact B. THERON CEO</p>	300	300	90	90	✓	✓	✓	✓	✓	✓	✓	TBM operation MTBM operation Tunneling equipment design & manufacturing	<p>CSM BESSAC, a worldwide major microtunneling contractor, presents 40 years of experience on tunnel and microtunnel projects.</p> <p>CSM BESSAC masters all mechanized excavation techniques (microtunneling, EPB TBM, Slurry TBM, air pressurized TBM) and has over 100 km of microtunneling and tunneling experience in about 100 projects in last 5 years. These works were realized in 20 countries on five continents.</p> <p>CSM BESSAC is ISO 9001, OHSAS 18001 and ISO 14001 certified.</p>
<p>Canary Systems Canary Systems, Inc. 5 Gould Rd New London, NH 03257 info@canarysystems.com +1 603 526 9800</p> <p>Primary Contact Alex Neuwirt CEO</p>	25	2			✓	✓	✓	✓	✓	✓	✓	geo-monitoring, data acquisition systems, instrumentation	<p>We provide cost-effective, reliable, state-of-the-art data collection and information systems to a broad market range, including tunneling, civil engineering, geotechnical engineering, mining, environmental, meteorological, and many more. This includes instrumentation selection, system architecture, hardware and software development, database development and web online data access systems.</p>


Company and contact information	Number of employees		Annual turnover USD (M)	Tunnel turnover USD (M)	Regions company works in							Specialist areas	Company profile	
	Total	In tunnelling			Africa	Asia	Australasia	Europe	Middle East	North America	South America			
<p>Collett &amp; Sons Ltd Victoria Terminal, Albert Road, Halifax, West Yorkshire, HX2 0DF info@collett.co.uk +44 (0)8456 255 233</p> <p>Primary Contact Chris Baker Heavy Transport/ Projects</p>	130	10									✓			<p>Heavy Transport, Heavy Lift, Marine Services, Transport Consulting, Abnormal Loads,</p> <p>Established in 1928, Collett &amp; Sons is a successful family owned company. Originally a Transport company, Collett has developed into a specialist multimodal logistics operator with a defined focus in its' four closely run divisions.</p> <p>With specialist teams dedicated to Transport, Heavy Lift, Marine &amp; Consulting, Collett &amp; Sons has evolved to reflect the diverse nature of the business and the clients it serves. These four integrated divisions allow Collett &amp; Sons to offer a 'one stop shop' service, expertly managing any project from concept through to completion.</p> <p>Specialists in the Renewables, Aerospace, Heavy Engineering, Oil &amp; Gas, Power Generation and Civil &amp; Infrastructure markets, Collett &amp; Sons have a wealth of experience transporting and moving difficult loads throughout the UK, Europe and Worldwide utilising our modern fleet of trucks, SPMTs and specialist trailers.</p>
<p>Compco Fire Systems Cleeve House, Malvern Road, Worcester, WR2 4YX enquiries@compco-fire.co.uk 01905 741600</p> <p>Primary Contact John Sinclair Managing Director</p>	415	100	33	1							✓			<p>Design, supply, installation and maintenance of Automatic Fire Sprinkler systems.</p> <p>For over 27 years, COMPCO has been at the forefront of protecting people and property from fire. As the UK's largest independently owned fire-engineering company, COMPCO has the expertise, resources and stability to meet the needs of clients and projects of any scale.</p> <p>From a project-managed installation to servicing and maintenance, we will tailor our services to the exact requirements of your project. With a broad experience in all fire-protection technologies, we will make sure you benefit from the most suitable solution for your needs.</p> <p>We have a long list of clients that have selected us to protect them from fire. These include landmark locations such as the British Museum, Royal Ascot and the Millennium Stadium, and blue chip companies such as IBM, IKEA, Honda and Rolls Royce.</p>
 <p>大陸工程公司 CONTINENTAL ENGINEERING CORP. A MEMBER OF CENTRAL HOLDINGS</p> <p>Continental Engineering Corp. 33/F Cambridge House, Taikoo Place, 979 King's Road, Hong Kong Tracy-Lee@continental-engineering.com +852 2960-1398</p> <p>Primary Contact Tracy Lee Executive Secretary &amp; Office Manager</p>	1500	500	480	130		✓								<p>TBM Operations, Segment Casting, Drill &amp; Blasting Tunnel, Project Management, NATM Tunneling</p> <p>CEC is the leading contractor in Taiwan operating across Asia in Hong Kong, Macau, Malaysia and India. CEC specialises in all forms of underground construction &amp; tunneling and has expertise with hard &amp; soft ground TBM's, NATM, D&amp;B and Cavern construction. Signature projects include Taiwan High Speed Rail (NATM tunnels, elevated viaducts and stations), numerous sections of Taipei Metro (TBM tunnels and stations) and numerous sections in Taichung Metro.</p> <p>In India CEC has undertaken complex underground projects for Delhi Metro, Bangalore Metro and Jaipur Metro (all of TBM tunnels and stations). In Malaysia CEC has completed tunnel construction on Kuala Lumpur Metro (TBM tunnel and station).</p> <p>In Hong Kong our Liantang Heung Yuen Wai Boundary Control Point Contract 6 includes substantial D&amp;B road tunnels and the Harbour Area Treatment Scheme (HATS) project includes deep shaft and D&amp;B tunnels. CEC celebrates its 70 years anniversary in 2015!</p>

Company and contact information	Number of employees		Annual turnover USD (M)	Tunnel turnover USD (M)	Regions company works in							Specialist areas	Company profile
	Total	In tunnelling			Africa	Asia	Australasia	Europe	Middle East	North America	South America		
<p>County Communications 8288 Telegraph Road Suite E Odenton, MD 21113 chris.woods@countycom.com +1 443-375-8751</p> <p>Primary Contact Christopher C. Woods Engineering - Ops Manager</p>	19	5									✓		<p>Temporary communications, Data, cameras. Leaky RF Cable Video CCTV - IP - Analog</p> <p>County Communications is a WOSB (US 8M Women Owned Small Business) specializing in communications and IT/Data.</p>
<p>CRS Tunnelling Inc. 1151 South Service Rd. West Unit # 3 Oakville Ontario L6L 6K4 walter@crstunneling.com 9054691200</p> <p>Primary Contact Walter Trisi Vice President</p>	80	80									✓		<p>TBM Operation, Tunnelling, Microtunnelling, Pipejacking, Sliplining</p> <p>CRS Tunnelling Inc. is the Canadian arm of Super Excavators Inc. USA Based in Oakville Ontario, specializing in Heavy Civil Construction with a focus on Mechanized Tunnelling. CRS Tunnelling is currently working on the Bathurst &amp; Teston Project in Richmond Hill and has picked up another contract in the Region of Peel at Lester B. Pearson International Airport, along with bidding Tunnelling work Canada Wide.</p>
<p>Datum Monitoring Datum Monitoring Datum House The Pavilions Bridge Hall Lane Bury Lancashire BL9 7NX info@datummonitoring.com 0161 7975511</p> <p>Primary Contact Nick Mahon Estimating Manager</p>	105	30	12	2.5	✓	✓	✓	✓	✓	✓	✓		<p>Supply of Instrumentation, Supply of monitoring services</p> <p>Datum design, manufacture, install and operate automated in-tunnel monitoring systems. Examples of recent projects include: Instrumentation and Monitoring Contract C405 - Crossrail Instrumentation and Monitoring Contract C305 - Crossrail</p>
<p>Devico AS Postbox 206 Drammensvegen 55 N-7224 Melhus Norway devico@devico.no +47 72 87 01 01</p> <p>Primary Contact Ben L'Heureux BDM - Marketing Manager</p>	45	20			✓	✓	✓	✓	✓	✓	✓		<p>Directional Core Drilling, Pilot hole Directional Core Drilling,</p> <p>When planning the construction of tunnels, rock caverns and shafts, an extensive investigation of the rock formation in the area is required. The investigation is used to identify problematic ground and secure an efficient and low-risk construction.</p> <p>Directional core drilling is an investigation method that allows core sampling along any defined trajectory, providing extremely accurate and relevant information about the rock formation near the planned underground construction.</p> <p>What directional core drilling can provide: Continuous core sample and geological information from the planned tunnel trajectory Data on the extent and orientation of problematic rock formations Information about the mechanical properties of the rock formations</p>

Company and contact information	Number of employees		Annual turnover	Tunnel turnover	Regions company works in							Specialist areas	Company profile
	Total	In tunnelling	USD (M)	USD (M)	Africa	Asia	Australasia	Europe	Middle East	North America	South America		
E-Berk Tunnel Et Foundation Technologies Anadolu Organize Sanayi Bolgesi 29 Ekim Cd. No:3 Temelli / ANKARA e-berk@e-berk.com +903122674848  Primary Contact Özgür Savaş ÖZÜDOĞRU General Manager	160	95	10	8		✓		✓	✓			TBM Operation, TBM Manufacturing, TBM Overhauling	E-Berk Machine and Metallurgy has been serving to Turkish Metal Industry since 1993, moreover E-Berk Machine and Metallurgy's activities have been continuing with providing Tunnel Boring Machines' spare parts and cutter head revisions since 2002.
Edilmac Dei Fratelli Maccabelli S.R.L. Via Trento, 16 24020 Gorle (BG) - ITALY edilmac@edilmac.com +39035661017  Primary Contact Dr. Giulio Maccabelli controller	95	25	13	5		✓		✓			✓	shaft sinking, raise boring machine, tunnels	Edilmac of F.LLI Maccabelli srl  Born in the late fifties has expanded over time, specializing particularly in the management of large quarries, and in the execution of tunnels and shafts.  Since 1976 EDILMAC acquired equipment and technology "RAISE BORER", with which is possible to do mechanically excavation of shafts, depth of hundreds of meters up to 6 meters in diameter. Then Edilmac developed its own equipment for the enlargement of shafts designed in larger diameters up to 6 meters.
EPOS - Empresa Portuguesa de Obras Subterraneas Lagoas Park, Edificio 1 2740 - 264 Porto Salvo Portugal geral@epos.pt +351213138180  Primary contact Telmo Lourenco Comercial Manager	538	511			✓	✓	✓	✓	✓	✓	✓	Tunnelling, Shaft-sinking, Mining	EPOS is a major contractor for underground works and the significance of the jobs undertaken are proof of its capacity to implement all types of tunnel and other underground works. Over 30 years of experience, EPOS has done work all over Portugal, in Spain, Algeria, Venezuela, Angola and Colombia. Having an excellent and qualified team of professionals, coupled with the latest technology and his vast experience, makes EPOS a reference now recognized in the market. EPOS portfolio includes construction of large road and railway tunnels, multiple interventions in underground hydraulic and hydropower projects, together with a permanent presence in mining. Most recent projects concluded are the hydraulic circuit for the Repowering of Salamonde Hydro-electric Scheme. In mining, the infrastructure development for Neves Corvo Mine in Portugal and for Aguablanca Mine in Spain.

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Ferrovial Agroman 10th Floor, BSI Building 389, Chiswick High Road London W4 4AL  t.nairne@ferrovial.com 442087502100  Primary contact Juan Elizaga Corrales Institutional Relations and R&D Director		615				✓	✓	✓	✓	✓	✓	Construction, civil works tunneling building and industrial works. 190 km of tunnels in urban areas	Ferrovial Agroman has successfully delivered more than 600 projects, designing and building some of the world's most complex turnkey projects under PPP schemes. Ferrovial Agroman currently manages an order book in excess of 10 billion euros - a record figure for the company. Our tunneling projects include:  Crossrail Project (BfK) C300 / C410 / C435 (Western running tunnels and Farringdon station upgrade - contract value approx £800 million Northern Line Extension (FL0) - £500 m  Espino Tunnel Project: 7.90Km AVE Madrid - Galicia, contract value 100m euros  Padornelo Tunnel: 92 M€ - High speed train Madrid - Galicia. - 6,4 km. long.  Linea 9 - Madrid Tube: 191 M€ - 2 different tunnels of 635 m and 1,500 m.
Gulermak CO. INC. Konya Devlet Yolu 23. km Gölbali 06830 Ankara, Turkey  insaat@gulermak.com.tr +903124841489  Primary contact Emrah Bas Business Development Engineer	2000	150				✓	✓	✓	✓	✓	✓	Tunnelling Et Metro Contractor (TBM Operation)	GÜLERMAK Heavy Industries Construction Et Contracting Co. Inc. was founded in 1958. The company has been operating since then with its long-established corporate history and its capable and experienced staff in tunnelling / metro projects.  Recent Tunnelling Et Metro Projects :  Warsaw Metro Line II (Poland) - 6.5 km Double Line Metro Otogar - Bagcilar Metro (Istanbul) - 21.5 km Double Line Metro Kadikoy - Kartal Metro (Istanbul) - 26 km Double Line Metro Mecidiyekoy-Mahmutbey Metro (Istanbul) - 17.5 km Double Line Metro Kecioren-Tandogan Metro (Turkey) - 6.5 km Double Line Metro Kargi HEPP - 12 Km HEPP Tunnel
John Holland 380 St Kilda Road Melbourne Vic 3004 AUSTRALIA tunnellingho@jhg.com.au +61399345209  Primary Contact Rob Muley General Manager Tunnelling	5000	100	4000	400		✓	✓					TBM Operation, mined tunnels, sprayed linings, segmental linings, GRP linings, shaft sinking	John Holland is one of Australia's leading engineering, contracting and services providers. We have been providing innovative high-performance engineering and construction solutions for more than 65 years.

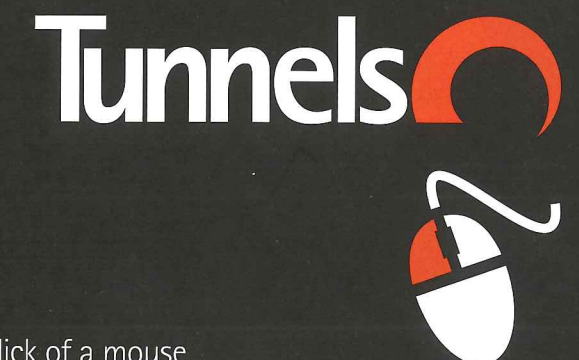
Company and contact information	Number of employees		Annual turnover USD (M)	Tunnel turnover USD (M)	Regions company works in							Specialist areas	Company profile			
	Total	In tunnelling			Africa	Asia	Australasia	Europe	Middle East	North America	South America					
 <p>Johnston Trenchless Solutions Watling Street, Shawell, Lutterworth, Leicestershire, LE17 6AS enquires@johnston-trenchlessolutions.co.uk 01788 861 790</p> <p>Primary Contact Paul Whitehouse Senior Estimator</p>	50	50									✓				Tunnelling, pipe jacking, microtunnelling, auger boring, horizontal directional drilling work	JTS are one of the UK's leading specialist "Trenchless" contractors with an enviable track-record of completed projects spanning the full range of Trenchless Disciplines. With a large in-house fleet of specialist equipment including Microtunnelling, Directional Drilling (HDD), Auger boring and Pipe Bursting, JTS have the edge when it comes to offering our clients the "best engineering solution" individually tailored to suit each project.
 <p>Joseph Gallagher Limited Neagron House, Stanford, Orsett, Essex, RM16 3BX headoffice@joseph-gallagher.co.uk 01375 672 070</p> <p>Primary Contact Richard Dexter Tunnelling Director</p>	850	400	110	60							✓	✓			Caisson & underpin shafts, SCL Tunnels, TBM, Microtunnelling, HDD, Auger boring, Hand-tunnelling	Joseph Gallagher Limited is the leading UK based Civil Engineering & Tunnelling sub-contractor that has grown significantly into an international business with a proven track record of working on award winning major infrastructure projects. The business also carries out design and build contracts developing bespoke engineering solutions for clients. Tunnelling remains the core business and with over 30 years' experience and record of delivery. Recent introduction of our LIFE behavioural safety programme has put the company at the forefront of ensuring tunnel safety going forward.
<p>Moretrench 100 Stickle Ave Rockaway, NJ 07866 info@moretrench.com 973-627-2100</p> <p>Primary Contact Paul Schmall Vice President</p>	690	300											✓		Ground freezing, grouting, dewatering, ground water control excavation support	Moretrench is a nationally recognized leader in geotechnical construction, specializing in site-specific design build solutions to meet project objectives and subsurface conditions. We have the experience, expertise and resources to resolve a wide range of shaft sinking and tunneling related challenges, and the emergency response capability for fast remediation of unanticipated conditions. Our technologies, including ground freezing, dewatering, and a range of soil and rock grouting methods, have been instrumental in the successful resolution of significant tunneling and deep shaft projects across the Unites States and in Canada. Visit our website to learn more about how Moretrench can assist you on your next project.
<p>OSSA Obras Subterranas Calle Aragoneses 2-A 3ª planta, Poligono Industrial de Alcobendas 28108 Alcobendas, Madrid (España) info@ossaint.com +34 917 823 400</p> <p>Primary Contact Luis Jane Guitart Business Development Manager</p>	1100	1100	200	200			✓	✓					✓		Drill and blast, mechanical excavation, TBM operation, mining, hydropower caverns, shafts.	OSSA is a leading specialist company in the underground construction sector, specialized in three business segments: Construction, Energy and Mining.

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<p>Parsons Corporation 100 West Walnut Avenue Pasadena, CA 91124 United States of America Steve.Minassian@parsons.com 1 (248) 513-2391</p> <p>Primary Contact Steve Minassian Sr. Vice President</p>		250	3000	100			✓	✓	✓	✓	✓	✓	✓	✓	Construction, design of underground for transportation, water, environmental, commercial, defense.	Parsons recently completed construction management services for the Lake Mead Intake No. 3 in Nevada, design and construction services for the Austin Downtown Sewer Tunnel in Texas, construction management services for the South Cobb Sanitary Sewer Overflow Tunnel in Georgia, Caldecott 4th bore highway tunnel in California.
 <p>SELI Technologies Via A. Campanile 73, 00144 Roma, Italy info@selitech.net +390687724200</p> <p>Primary Contact Andrea Imbrenda CFO</p>	26	26	20	20			✓	✓		✓	✓	✓	✓	✓	TBM design, Jobsite technical assistance, TBM overhauling, auxiliary equipment design	Seli Technologies Ltd, established at the end of 2013, inherits the expertise and know-how developed in more than 60 years by the Seli Spa Group in civil works design, special underground equipment design, manufacturing and overhauling (Tunnel Boring Machines, Backup, Rolling stock, etc.)
<p>Soldata Inc. 1448 Elliott Ave. W. Seattle, WA 98119 info@soldatainc.com (206)588-1691</p> <p>Primary Contact Loic Galisson General Manager</p>	22	18											✓		Instrumentation/ Monitoring, Integrated Data Management Systems, InSAR	Soldata Inc. is one of the leading companies dealing in geotechnical instruments and monitoring devices. Our primary job is to provide risk management solutions in geotechnical, structural and environmental projects. With an experience of more than ten years, we are proud to establish that we are among the best to provide instrumentation solutions with maximum accuracy. Our highly accurate software for monitoring geotechnical projects has registered a successful record during application in various large as well as medium sized projects across the United States.
<p>Tony Ridley Hyperbaric Associates Church Farm, Bramerton Road, Surlingham, Norwich, Norfolk. UK. NR14 7DE info@hyperbaric-tunnelling.com +44(0)1508 538 838</p> <p>Primary Contact Tony Ridley Director</p>	20	18	2	2			✓	✓	✓	✓	✓	✓	✓	✓	Compressed Air Working, TBM Intervention, Occupational Safety & Health, All related Supports	TRHA Ltd is a UK based company (Est 1997) providing specialist services to tunnelling contractors on a fully international basis. Recent / Current projects include, Los Teques Metro, Lee Tunnel, Notre Rio Medellin, Crossrail, Eccles WwTW, Shieldhall Strategic Tunnel

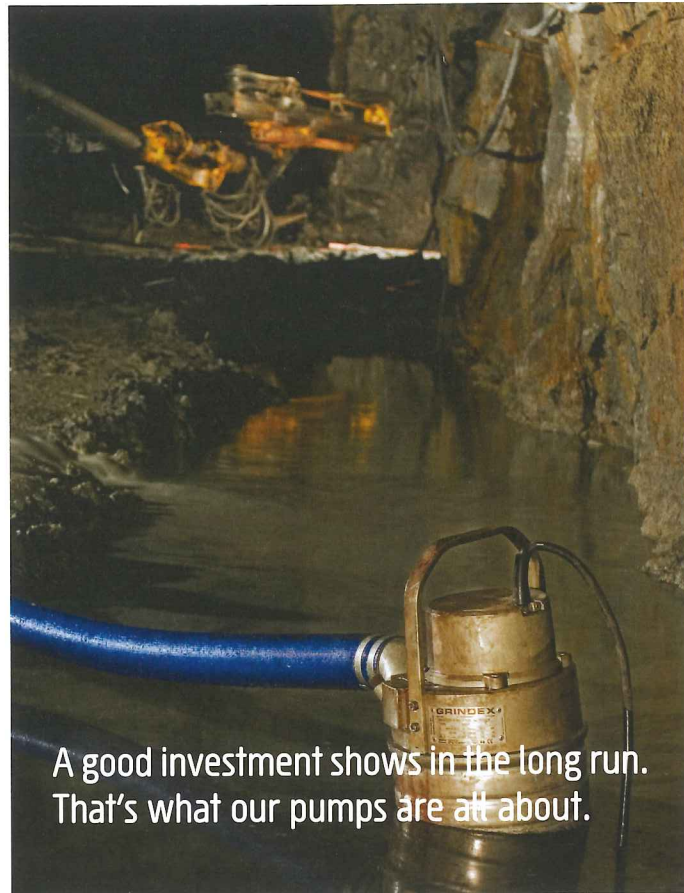
Company and contact information	Number of employees		Annual turnover USD (M)	Tunnel turnover USD (M)	Regions company works in							Specialist areas	Company profile
	Total	In tunnelling			Africa	Asia	Australasia	Europe	Middle East	North America	South America		
TOTO Costruzioni Generali Viale Abruzzo, 410 66013 Chieti - ITALY info@totospa.it +39 0871 58741  Primary contact Marco Toresi COO Overseas	565	100			✓	✓	✓	✓	✓	✓	✓	TBM tunnelling, ADECO-RS tunnelling, segment casting	TOTO Costruzioni Generali is a General Contractor and an EPC Contractor primarily active in the transport infrastructures. With a core business in the tunnelling (both mechanized and traditional method), bridges and precast products sector, TOTO designs, builds and operates complex transport infrastructure projects, performing in both the road and railway sectors. TOTO Costruzioni Generali has been nominated Tunnelling Contractor of the Year 2013 at NCE International Tunnelling Awards for Sparvo Tunnel, where he operated the 16m diameter giant EPBM "Martina".
VINCI Construction Grands Projets 5, cours Ferdinand de Lesseps 92851 Rueil-Malmaison France www.vinci-construction-projets.com +33147164700  Primary contact Corinne Tessier Assistant Tunneling Department	1000	1000			✓	✓	✓	✓	✓	✓	✓	TBM Drill & blast Ground freezing Segment production Shaft sinking Hydro-electric D&B	As part of a lineage of 100-year-old companies whose names are associated with impressive achievements worldwide, VINCI Construction Grands Projets possesses end-to-end expertise in the creation of complex infrastructure. Throughout the world, VINCI Construction Grands Projets designs and builds major civil engineering structures (tunnels, bridges, dams, liquefied natural gas storage tanks, road and rail infrastructure) and buildings (skyscrapers, shopping centres, hotels, major industrial facilities, nuclear power plants, etc.).
<b>WARD &amp; BURKE CONSTRUCTION LIMITED</b> Ward and Burke Microtunnelling 2410 Meadowpine Blvd., Unit 101, Mississauga, ON L5N 6S2, Canada info@wardandburke.com +19058213012  Primary contact John Grennan Director	100	70			✓	✓	✓	✓	✓	✓	✓	Microtunnelling, Caisson Shaft Construction, Civil Engineering, Reinforced concrete structures	Ward & Burke is a Civil Engineering Company established in 2001. We have become a leader in the Civil Engineering industry and undertake work primarily in sanitary services infrastructure, road and bridge construction, and specialist no-dig solutions. Having concentrated in recent years in specialist civil engineering works, in situ caissons, microtunnelling, large diameter pipelines, etc., it became apparent that additional markets/outlets would be required to facilitate our continued development and expansion. In 2008 we entered the UK market and the resulting success allowed the company to enter the Canadian market in 2011. Recent projects include Keswick WPCP Effluent Outfall Expansion, runner up of NASTT Best New installation 2013, North Don Sanitary Sewer Project, and Elgin Mills Road Waterman. These projects have reset the boundaries for microtunnelling in North America.

Company and contact information	Number of employees		Annual turnover USD (M)	Tunnel turnover USD (M)	Regions company works in							Specialist areas	Company profile
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WWL ALS (Wallenius Wilhelmsen Logistics Abnormal Load Services) UK Intl Limited 1501 Hedon Road Kingston Upon Hull HU9 5NX info.tunnelling@als-europe.com +44 (0) 1482 796214  Primary Contact Paul Braithwaite Operator Special Projects	85	5			✓	✓	✓	✓	✓	✓	✓	Experienced operators offering comprehensive logistics solutions for delivering TBMs and equipment.	WWL ALS is a 3PL & 4PL freight forwarding company specialising in the global logistics of Project Forwarding, Capital Equipment, Abnormal Loads and Supply Chain Management. We provide the reassurance of many years' experience of successfully managing the handling and delivery of tunnel boring machines (TBMs), back-up and ancillary equipment, utilising multi-modal solutions within the UK, throughout Europe and to/from worldwide locations.  Latest job: 595T TBM "Busy Lizzie" London Lee Tunnel project July 2015. <a href="http://www.abnormal-loads.com/en/latest-news/lee-tunnel-project-tbm-busy-lizzie-returns-to-germany">http://www.abnormal-loads.com/en/latest-news/lee-tunnel-project-tbm-busy-lizzie-returns-to-germany</a>  VIDEO: London Crossrail - WWL ALS project: <a href="https://www.youtube.com/watch?v=hnW0uR0ghxw">https://www.youtube.com/watch?v=hnW0uR0ghxw</a>  www.wwlals.com
Yapi Merkezi Construction Inc. Haci Resit Pasa Sk. No.4, Camlica, Istanbul, Turkey kurumsal.iletisim@ym.com.tr +90 216 321 90 00  Primary Contact Mr.Ozge Arioglu CEO	8500	833	805	159	✓	✓	✓	✓				Tunnels, viaducts and bridges, metros, tramways, light rail systems and stations.	Established in 1965. 42 million m <sup>2</sup> of structures we have engineered provide happiness for their users. With 2600 km of railways and 300 stations in 39 projects, we provide safe transport for more than 2 million passengers daily in three continents. 5600 km of waterproof pipeline provides clean water to hundreds of locations in 40 countries. By producing 3000 kg/cm <sup>2</sup> strength concrete, we serve to the civilization.

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# EQUIPMENT

The alphabetical list of equipment manufacturers in the tunnelling industry,  
as collected by the *Tunnels and Tunnelling* survey



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	Total	In tunnelling			Africa	Asia	Australasia	Europe	Middle East	North America	South America		
<p>ABC Ventilation Systems 1802 Quebec Avenue, Saskatoon SK, Canada info@abcventilation.com +13066534303</p> <p>Primary contact Gary D Thorinson Director - International Marketing</p>	200	100			✓	✓	✓	✓	✓	✓	✓	Underground Ventilation, Cooling, Heating, Dust Removal, Ducting (Lay-flat & Hardline), Fans	ABC Ventilation Systems is the world leader in underground ventilation products. ABC has close to 50 years in the industry and reference projects in over 52 different countries. With offerings such as Ducting, Fans, Deduster's, Make-up Air Units, Controls, and Sensors ABC can truly supply the full turn-key ventilation package.
<p>Advanced Marine 1 Gul Street 4 Jurong Singapore 629233 Republic of Singapore admar@advanced-marine.com.sg +65 6265 8122</p> <p>Primary Contact Jeff Bradford Managing Director</p>	52	12	12	2		✓	✓					Medical Lock design/manufacture/servicing/sale/rental/operators, Compressed Air training & audits	Established in 1979 and celebrating over 35 years of service, Advanced Marine is South East Asia's leading supplier of all types of Commercial Diving, Survey, ROV and Subsea Equipment. We design and manufacture a diverse range of equipment including Decompression and Hyperbaric Chambers, LP. and H.P. Divers Air Compressor, Gas and Depth Control Panel, Helium Gas Recovery System, Environmental Control Unit, Viewports and Custom built requirements. We have designed and produced up to 1,454 products as of 2015 including Medical / Man locks for 15 projects in Singapore. Our Survey section includes ROV's and ancillary equipment, Underwater Modems and Tracking Systems, Cables, Connectors and Sliprings. Our Slogan is "The Total Service Company", providing Consultation, PVHO and Dive System Engineering, AutoCAD/3D Drawings, Solid Works Stress Analysis, Sales, Rental and Back-up Service.
<p>Agir Aggregat AG Agir Aggregat AG Alte Obfelderstrasse 55 CH-8910 Affoltern a.A. Switzerland aggregat@agir.biz 0041 44 762 44 22</p> <p>Primary contact Carl Wassermann Head Acquisition</p>	300	75			✓	✓	✓	✓	✓	✓	✓	mucking, conveying, material logistics, screening, crushing, water treatment	Agir supplies and operates the complete package of material logistics for tunneling from TBM or drill-and-blast heading to the landfill or railway/ship/truck loading.
<p>Akkerman 58256 266th Street Brownsdale, MN 55918 akk@akkerman.com +1 800 533 0386</p> <p>Primary Contact Akkerman Sales Akkerman Sales</p>	75	75			✓	✓	✓	✓	✓	✓	✓	GBM (Pilot Tube), MTBM, TBM, and EPBM pipe jacking and tunneling systems	Established in 1973, Akkerman develops, manufactures and supports quality pipe jacking and tunneling equipment that accurately installs a variety of underground infrastructure. We partner with contractors to explore project solutions for a wide range of geology, pipe diameters and lengths. Akkerman is driven for customer success.
<p>Alpine Equipment 801 Pleasant View Blvd info@alpinecutters.com +1 8144667134</p> <p>Primary contact Chip Kogelmann President</p>	8	8			✓	✓	✓	✓	✓	✓	✓	Rotary Cutterheads, roadheaders, tunnel excavators	Alpine specializes in rock & concrete cutting attachments, roadheaders, and soil mixing equipment. For over 40-years we have provided innovative, cost-effective solutions for the construction, mining, and environmental remediation sectors.

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<p>Alvenius Kungsgatan 75 lars.bergstrom@alvenius.se +46 16 166500</p> <p>Primary contact Lars Bergström Export Manager</p>	50	50			✓	✓	✓	✓	✓	✓	✓	Pipe systems and solutions, Quick couplings, Water supply, Corrosion protection, Special pipes	Alvenius is a Swedish manufacturer of steel pipe systems, with more than 60 years experience from supply to tunnelling and construction projects around the globe. Important advantages of the Alvenius pipe system: high quality, low weight/quick installation, corrosion protection, energy efficient pumping of media. Recently supplied 80km of galvanized pipes and fittings to the Crossrail project in London.
<p>Applied Industrial Systems Ltd 2B Belmont Road, Chiswick, London. W4 5UH, United Kingdom keith@applied.co.uk +44 208 747 2130</p> <p>Primary contact Mr Keith Bloomer Technical Sales Manager</p>	17	13			✓	✓	✓	✓	✓	✓	✓	Tunnel Monitoring System, SCADA, Ventilation Control, Environmental Monitoring, System Integration.	Applied Industrial Systems (AIS) Ltd are Consultants and System Integrators specialising in all aspects of tunnel monitoring and control systems during tunnel construction and operation. Previous projects include installations at Dartford, Heathrow Airport & Mersey Tunnels. The Tunnel Monitoring System (TMS) product provides tunnel contractors with an integrated safety monitoring/control solution, based upon proven software and the latest industry technology.
 <p>ArcelorMittal ArcelorMittal Bissen Route de Finsterthal L-7703 Bissen G.D. of Luxembourg s.mathieu@arcelor-mittal.com +352 621234062</p> <p>Primary Contact Stephane MATHIEU Senior Technical Officer Underground Solutions</p>	400	80			✓	✓	✓	✓	✓	✓	✓	Steel fibres for concrete, shotcrete, reinforcement for tunnel lining segments, precast elements..	ArcelorMittal is one of the leading steel fibres suppliers providing safe, sustainable and cost effective constructive solutions for industrial, residential and civil construction markets. Our technical and sales teams offer comprehensive services throughout the world with customized support to all involved in the design, specification and installation of steel fibre reinforced concrete. Today we are present in more than 25 countries providing the latest technology on steel fibre reinforced concrete projects.
 <p>Atlas Copco Klerkgatan 21 SE-702 25 Örebro, Sweden underground@se.atlascopco.com +19 6707000</p> <p>Primary Contact Hanna Knutsson Global Communications and Brand Manager</p>		4000			✓	✓	✓	✓	✓	✓	✓	Face Drilling Rock Reinforcement Raise boring Load Haul Graut Ventilation Scaling Charging Shotcrete	Atlas Copco is a world-leading provider of sustainable productivity solutions. The Group serves customers with innovative compressors, vacuum solutions and air treatment systems, construction and mining equipment, power tools and assembly systems.  Underground Rock Excavation is a division within Atlas Copco's Mining and Rock Excavation Technique business area. It develops, manufactures, and markets a wide range of tunneling and mining equipment for various underground applications worldwide. Atlas Copco's strong focus on innovative product design and aftermarket support systems gives added customer value.



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	Total	In tunnelling			Africa	Asia	Australasia	Europe	Middle East	North America	South America				
<p>Avancia Engineering Enterprises 201-GTH Building -Al Salam St. Abu Dhabi-UAE avancia@avancia.ae +97126222534</p> <p>Primary Contact Asem Abdelrazeq Sales and marketing Manager</p>	10	10									✓			<p>Fire Protection solutions for Road, Rail and Metro Tunnels as per Rijkswaterstaat, RWS Curve</p> <p>Tunnels and underground stations -Barcelona's Underground Barcelona, Spain -Malaga Underground Malaga, Spain -T4 Local Train Station in Madrid, Spain -Metrosur Tunnel in Madrid Spain</p> <p>Airport -Midfield Terminal Tunnel in Abu Dhabi, U.A.E. -Al Etihad International Airport in Abu Dhabi, U.A.E.</p> <p>Other Tunnels - Football Stadium, New entrance Tunnel, U.A.E.</p>	<p>Road Tunnels -Al Salam Street Tunnel in Abu Dhabi, U.A.E. -Bypass M-30 Tunnel in Madrid, Spain -Al Ras Al Akhdar Tunnel in Abu Dhabi, U.A.E. -Baynoonah Street Tunnel in Abu Dhabi, U.A.E. -Marina Coastal 482 Tunnel in, Singapore</p>
<p>Becker Mining America 6072 Ohio River Road Huntington WV 25702 www.beckermingamerica.com 304-736-8933</p> <p>Primary contact Justin Tidd Eastern Director of Sales and Marketing</p>	1500	75			✓	✓	✓	✓	✓	✓	✓		<p>Energy Distribution, Automation, Communication, Transportation, and Electrical Components</p>	<p>BMA designs and manufactures electrical components, open-type/explosion proof enclosures, motor starters, longwall electrical controls and distribution equipment, machinery parts, maintenance equipment and supplies for a variety of industries. The success of BMA resulted in seven major facility expansions that increased the product lines to include transformers, distribution equipment, electronic monitoring devices, connectors, and an assortment of vacuum switches. BMA is the world's leading supplier of wireless communications, tagging, tracking, proximity detection, and two-way radio communications for the mining and tunneling industry. BMA's tagging and tracking, atmospheric monitoring, and technically advanced proximity detection systems have built in fail-safe features that are critical to safety and production.</p>	
<p>BeMo Tunnelling Bernhard-Hoefel-Strasse 11 6020 Innsbruck Austria office@bemo.net +435123311433</p> <p>Primary contact Josef Arnold Managing Director (CEO)</p>	365	365			✓	✓	✓	✓	✓	✓	✓		<p>NATM, SEM, SCL, Scandinavian Method, TBM, special foundation works</p>	<p>BeMo is a specialist in the engineering and construction of all kinds of underground structures, whether new construction, refurbishment, reinstatement or reconstruction. - Underground Construction &amp; Tunnelling - Special Foundation Engineering - Know-how Transfer &amp; Consulting - Design for Tunnels and Underground Structures - Tunnel Survey &amp; Geotechnical Measurements for Tunnelling State-of-the-art technology for all types of ground Our highly qualified and committed team of experts is known internationally for its broad scope of technical competence and innovative solutions for the design and delivery of complex and challenging tunnel works. NATM, SCL, SEM, Scandinavian Method, TBM-Tunnelling Certifications: ISO 9001 + ISO 14001 + OHSAS 18001 and SCC** Recent projects: Crossrail C510, London, UK Metro Stadtbahntunnelk, Karlsruhe, Germany</p>	


Company and contact information	Number of employees		Annual turnover USD (M)	Tunnel turnover USD (M)	Regions company works in							Specialist areas	Company profile	
	Total	In tunnelling			Africa	Asia	Australasia	Europe	Middle East	North America	South America			
<p>BESSAC ZI de la Pointe 31790 Saint Jory France csmbessac@csmbessac.com +33 5 61 37 63 63</p> <p>Primary Contact B. THERON CEO</p>	300	300	90	90	✓	✓	✓	✓	✓	✓	✓		<p>TBM operation MTBM operation Tunneling equipment design &amp; manufacturing</p>	<p>CSM BESSAC, a worldwide major microtunneling contractor, presents 40 years of experience on tunnel and microtunnel projects. CSM BESSAC masters all mechanized excavation techniques (microtunneling, EPB TBM, Slurry TBM, air pressurized TBM) and has over 100 km of microtunneling and tunneling experience in about 100 projects in last 5 years. These works were realized in 20 countries on five continents. CSM BESSAC is ISO 9001, OHSAS 18001 and ISO 14001 certified.</p>
<p>Brauer Dawson Road Milton Keynes MK1 1JP sales@brauer.co.uk 01908 374022</p> <p>Primary contact Paul Tuffs Sales Manager</p>	50	50			✓	✓	✓	✓	✓	✓	✓		<p>TBM support equipment, Gantry equipment, conveyor equipment, spoil truck equipment.</p>	<p>Brauer manufactures specialist wheels and castor units and wheel and axle assemblies for use in tunnelling and associated lining processes post boring. We recently worked on the London gas ring main extension with J Murphy &amp; Sons Ltd manufacturing specialist pipe laying trollies.</p>
<p>Brewis Engineering Ltd Handlemaker Road Marston Trading Estate Frome Somerset BA11 4RW paula@brewisengineering.co.uk +44 1373 468864</p> <p>Primary Contact Paula Fitch Commercial Director</p>	15	1					✓	✓			✓	✓	<p>Trenchless Technology</p>	<p>Established for 30 years, Brewis Engineering Ltd is a design and Manufacturing company with a vast knowledge of the Trenchless industry.  Created the original and best Towing heads and Big Rig swivels available.</p>
<p>BROKK P.O. Box 730 SE-931 27 SKEL-LEFEÅ SWEDEN info@brokk.com +46 (0)910711800</p> <p>Primary contact Eva Skinner Marketing Communications Manager</p>	260	40			✓	✓	✓	✓	✓	✓	✓		<p>Safety nisch,adits, tunnel/Cross passage, metro,tunnel enlargement, Shaft</p>	<p>Brokk is the world's leading manufacturer of remote controlled demolition machines. Since 1976 the company has developed demolition and maintenance solutions for the construction, cement, mining, metal process, tunnel and nuclear industry, as well as a variety of demoiion solutions for special assignments and projects world wide. The headquarters is located in Sweden and the prouducts are marketed, sold and serviced through a global network of subsidiaries, distributors and agents. For more information, go to www.brokk.com</p>
<p>Brookville Equipment Corporation 175 Evans Street Brookville PA 15825 USA info@brookvillecorp.com +1 814 849 2000</p> <p>Primary contact Michael White Sales Manager</p>	200	120			✓	✓	✓	✓	✓	✓	✓		<p>Locomotives, Personnel Carriers, Combina- tion Vehicles, Specialty vehicles for haulage and transport</p>	<p>Founded in 1918, Brookville is a leading custom manufacturer of diesel, battery, and trolley powered haulage and transport equipment for mining and tunneling applications. Brookville's rail-mounted and rubber-tired equipment portfolio includes locomotives, personnel carriers, combination vehicles and other specialty vehicles, including permissible equipment.</p>


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<p>CBE GROUP 17-23 rue Frédéric Joliot-Curie F-37550 Saint-Avertin France cbe@cbegroup.fr +33247375364</p> <p>Primary Contact Julien Travers Sales Manager</p>	200	200	34	32	✓	✓	✓	✓	✓	✓	✓	Segment moulds, segment precast facilities, segment carousel plants, segment handling equipment	<p>We design and manufacture tunnel segment moulds, automated precast facilities for segment production (carousel) and segment handling equipment. We ensure assembly of precast plants, staff training and maintenance worldwide. CBE Group has been involved in more than 45 projects over the last two years. Recent achievements include: NWRL Sydney, Bouskoura, Sao Paulo Metro, Los Angeles Regional Connector, Liantang, Tabriz Metro, Shieldhall, Rastatt Tunnel, Paris Metro ligne 14, Follo Line, Wuhan Sanyan, Shanghai, Zhengzhou.</p>
<p>China Railway Engineering Equipment Group No. 99, 6th Avenue, National Economic and Technological Development Zone, Zhengzhou, Henan Province, China</p> <p>cregoverseas@crectbm.com +86 371 60608729</p> <p>Primary Contact Li Jianbin Chairman of the Board</p>	1326	398	269.63	237.43		✓						Shield machine/TBM manufacturing, tunneling, segment casting	<p>China Railway Engineering Equipment Group Co., Ltd. is a subsidiary company of China Railway Group Limited (CREC) which is one of the Fortune Global 500 companies, consists of 46 subsidiaries, turnover is more than 600 billion Yuan with 280,000 employees; CREG presently is the largest manufacturer of tunneling machine in China with domestic market share over 50% and successfully entered the international market. Up to date, CREG has manufactured 220 shield machines and signed more than 260 orders. The shield machines are widely used in various key projects in China as subway, municipal utility pipe gallery, tunnel, water conservancy projects, so on and so forth. Meanwhile, the equipment also exported to Malaysia, Singapore, Lebanon, Israel, India and other countries.</p>
<p>CODEL International Ltd Station Building, Station Road Bakewell Derbyshire DE45 1GE UK sales@codel.co.uk +44 (0)1629 814351</p> <p>Primary Contact James Gilbert Sales Manager</p>	30	20	5	3	✓	✓	✓	✓	✓	✓	✓	Tunnel Atmosphere Monitors, Flow monitors, Gas monitors, Visibility monitors,	<p>CODEL International Ltd is a manufacturer of pollution monitors for road tunnels. We have a worldwide Distribution and Service network. CODEL have supplied monitoring systems to over 500 tunnels worldwide.</p>
<p>Compco Fire Systems Cleeve House, Malvern Road, Worcester, WR2 4YX enquiries@compco-fire.co.uk 01905 741600</p> <p>Primary Contact John Sinclair Managing Director</p>	415	100	33	1				✓				Design, supply, installation and maintenance of Automatic Fire Sprinkler systems.	<p>For over 27 years, COMPCO has been at the forefront of protecting people and property from fire. As the UK's largest independently owned fire-engineering company, COMPCO has the expertise, resources and stability to meet the needs of clients and projects of any scale. From a project-managed installation to servicing and maintenance, we will tailor our services to the exact requirements of your project. With a broad experience in all fire-protection technologies, we will make sure you benefit from the most suitable solution for your needs. We have a long list of clients that have selected us to protect them from fire. These include landmark locations such as the British Museum, Royal Ascot and the Millennium Stadium, and blue chip companies such as IBM, IKEA, Honda and Rolls Royce.</p>

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<p>Compressed Air Work Zengerstr. 11a 85399 Hallbergmoos Germany info@compressed-air-work.net +49(0)811 99885766</p> <p>Primary contact Peter Späth Managing Director</p>	3	1			✓	✓	✓	✓	✓	✓	✓	Compressed Air Intervention System	<p>S-788 U5 Berlin S-550, S-623/624 Guangshengang Tunnel Shenzhen CCCC -Weisan Road River-Crossing Tunnel South, North YMSK - Istanbul Strait Road Tube Crossing Project Crossrail Thames Tunnel-London ARGE Tunnel Weinberg, Zürich ARGE Tunnel XFEL Werkstatt</p>
<p>C.Scope International Kingsnorth Technology Park, Wotton Road, Ashford, Kent, TN23 6LN, U.K. info@cscope.co.uk +44 1233 629181</p> <p>Primary contact Paul Wells Sales Director</p>	60	60			✓	✓	✓	✓	✓	✓	✓	Utility Detection and Mapping.	<p>C.Scope International Ltd is one of the world's leading designers and manufacturers of Pipe and Cable Detection and Location products. We produce a range of Cable Avoidance Tools and Signal Generators that are able to quickly and reliably detect the exact position and depth of buried pipes and cables, keeping all staff who are involved in tunneling or trenchless utility installation work, safe. Our Cable Locators are rugged, robust and simple to operate and are now in widespread use throughout the utility industry. The workforce of renowned organisations such as British Telecom and National Grid are now being kept safe through the use of C.Scope Location equipment.</p>
<p>Datum Monitoring Datum Monitoring Datum House The Pavilions Bridge Hall Lane Bury Lancashire BL9 7NX info@datummonitoring.com 0161 7975511</p> <p>Primary Contact Nick Mahon Estimating Manager</p>	105	30	12	2.5	✓	✓	✓	✓	✓	✓	✓	Supply of Instrumentation, Supply of monitoring services	<p>Datum design, manufacture, install and operate automated in-tunnel monitoring systems. Examples of recent projects include: Instrumentation and Monitoring Contract C405 - Crossrail Instrumentation and Monitoring Contract C305 - Crossrail</p>
<p>Devico AS Postbox 206 Drammensvegen 55 N-7224 Melhus Norway devico@devico.no +47 72 87 01 01</p> <p>Primary Contact Ben L'Heureux BDM - Marketing Manager</p>	45	20			✓	✓	✓	✓	✓	✓	✓	Directional Core Drilling, Pilot hole Directional Core Drilling,	<p>When planning the construction of tunnels, rock caverns and shafts, an extensive investigation of the rock formation in the area is required. The investigation is used to identify problematic ground and secure an efficient and low-risk construction.</p> <p>Directional core drilling is an investigation method that allows core sampling along any defined trajectory, providing extremely accurate and relevant information about the rock formation near the planned underground construction.</p> <p>What directional core drilling can provide: Continuous core sample and geological information from the planned tunnel trajectory Data on the extent and orientation of problematic rock formations Information about the mechanical properties of the rock formations</p>

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Duran Audio BV Koxkampseweg 10 5301KK Zaltbommel The Netherlands info@duran-audio.com +31 418 515583  Primary contact Nick Screen Sales Director	35	35			✓	✓	✓	✓	✓	✓	✓	Public Address Systems for tunnels Voice Evacuation System for tunnels  The AXYS ABF260 is designed to overcome these problems and be the ultimate message delivery service in tunnels; delivering clear and intelligible announcements to the occupants of a Tunnel.	Duran Audio offers complete Public Address/Voice alarm solutions for tunnels. Keeping passengers safe and on the move are the key priorities for tunnel managers and operators, a good PA system can help overcome some of the challenges faced on a day to day basis by providing an effective means of communication between the operators and tunnel users. However, Road tunnels are very difficult acoustic environments and achieving acceptable levels of intelligibility is often difficult or impossible to achieve.
E-Berk Tunnel Et Foundation Technologies Anadolu Organize Sanayi Bolgesi 29 Ekim Cd. No:3 Temelli / ANKARA e-berk@e-berk.com +903122674848  Primary Contact Özgür Savaş ÖZÜDOĞRU General Manager	160	95	10	8		✓		✓	✓			TBM Operation, TBM Manufacturing, TBM Overhauling	E-Berk Machine and Metallurgy has been serving to Turkish Metal Industry since 1993, moreover E-Berk Machine and Metallurgy's activities have been continuing with providing Tunnel Boring Machines' spare parts and cutter head revisions since 2002.
ECE COGEMACOUSTIC 42 route du Palais P.O BOX 575 87022 LIMOGES Cedex 9 FRANCE poriez@cogemacoustic.com +33 555 37 35 37  Primary contact ORIEZ Patrick Marketing Manager	45	42			✓	✓	✓	✓	✓	✓	✓	Ventilation axial fans, ventilation design, dust collectors, PVC ducting, ventilation audit	ECE COGEMACOUSTIC is specialized for more than 30 years in ventilation design and ventilation equipment for tunneling and mining operation. With a worldwide operation and more than 300 ventilation studies every year ECE COGEMACOUSTIC is one of the most reputable partner in ventilation expertise. We have recently supplied projects like STP in Seattle, COCIV in Italy, Vinci in Chile, XRL project in Hong Kong
FASO Urbanização Quinta de São Martinho, 35A - 2º. Dto. 2645-024 Alcabideche Portugal faso.cranes@gmail.com +351919226689  Primary contact Fernando Soares de Oliveira Sales Manager	12	2			✓	✓	✓	✓	✓	✓	✓	-	-



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FOGTEC Fire Protection FOGTEC Brandschutz GmbH & Co. KG Schanzenstrasse 19A D-51063 Köln (Cologne) Germany contact@fogtec.com +49 221 96223-0  Primary contact Max Lakkonen General Manager - Tunnel Systems	120	25			✓	✓	✓	✓	✓	✓	✓	Water mist systems, water spray systems, consultancy, risk analysis, fire tests, RAMS analysis, SIL2	FOGTEC is the leading specialist for the design and installation of active fire fighting systems (high pressure water mist and water spray systems) for tunnels and subsurface facilities. FOGTEC's fire fighting systems have been approved in more than 200 full scale tunnel fire tests. FOGTEC has participated in well-known tunnel safety research projects like FIT, UPTUN and SOLIT / SOLIT2. FOGTEC's high pressure water mist systems are protecting various high profile tunnels and underground facilities such as the Virgolo Tunnel (Bolzano, Italy), M30 Tunnel (Madrid, Spain), New Tyne Crossing (Newcastle, UK), Eurotunnel (Channel Tunnel, France / UK) and the Dartford Crossing (London, UK). The scope of FOGTEC's works includes consultancy, fire testing, risk analysis, design, installation, project management, RAMS analysis, SIL2 control systems, SCADA systems, detection systems and maintenance.
GEODATA Group Hans-Kudlich-Straße 28, A-8700 Leoben Austria office@geodata.at +433842265550  Primary contact Gerd Krusche Head of Marketing	120	80			✓	✓	✓	✓	✓	✓	✓	guidance systems, laser scanning, geotechnical instruments, information management, data acquisition	With numerous commissions for complex large-scale building projects, GEODATA has acquired an outstanding level of competence in surveying for tunnelling and shallow underground construction projects, especially in inner-city environments, as well as for slope protections, foundation engineering and mining projects. Today, Geodata operates worldwide as a competent partner for projects of all sizes, offering solutions for geotechnical and geodetic measurements and surveying. GEODATA is actively involved in numerous projects around the world. Among our most prestigious projects are the Crossrail railway system in the city of London and the metro system in Copenhagen. The new lines of Metro Santiago in Chile as well as the Metro Delhi are constructed using Geodatas know-how. The high speed rail tunnel projects Koralm and Semmering base tunnel are major projects in Austria.
 Geokon, Inc. 48 Spencer Street Lebanon, NH 03766 Info@geokon.com 6034481562  Primary Contact Chuck Chamley Tony Simmonds	110	110			✓	✓	✓	✓	✓	✓	✓	Quality built geotechnical instrumentation for tunneling monitoring since 1979.	Many tunnels and subway systems in major cities around the world have used Geokon instruments. Geokon, Inc. is a specialist in the supply of instruments for the NATM method of tunnel support. In addition to almost all major cities in the USA, we have instrumented subway systems in Seoul, Taipei, Guangzhou, Istanbul, Hong Kong, Singapore and London. We also have instruments in the Channel Tunnel.
 Trouble-free dewatering since 1960 Grindex Grindex AB Box 7025 SE-174 07 Sundbyberg Sweden marketing@grindex.com +46 8 606 66 00  Primary contact Peter Uvemo General Sales Manager	35	5			✓	✓	✓	✓	✓	✓	✓	Construction, Mining, Industry	Grindex is a world leader in electrical submersible pump technology for demanding applications such as construction, mining and heavy industry. Grindex was founded in 1940 in Stockholm, Sweden, and since 1960 we've been dedicated to develop absolutely the best quality electrical submersible drainage, sludge and slurry pumps. The pumps are known worldwide for their high reliability, durability and dependability, and they are designed to be used in the most challenging environments imaginable - without compromise for our professional users. Thanks to the built-in motor protection and the air valve, the pumps can run unsupervised for longer periods, and even run dry for a length of time. Grindex exports to more than 100 countries around the world, and has a subsidiary in the USA (Grindex North America).

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GUMBA-LAST PoB 1307 D 85627 Grasbrunn Germany info@gumba-last.de +49 89 461460  Primary contact Export Dept Export Dept					✓	✓	✓	✓	✓	✓	✓	Elastomeric Waterstop Systems Worldwide Standard DIN 7865	-
 Herrenknecht AG Schlehenweg 2 D-77963 Schwanau Germany  pr@herrenknecht.com +49 7824 302 0  Primary Contact Achim Kühn Head of Group Marketing and Corporate Communications	4939	4939	1427	1427	✓	✓	✓	✓	✓	✓	✓	TBMs, micromachines, HDD, deep drilling, mining, shaft sinking, service, consultancy, personnel	Herrenknecht is a technology and market leader in the area of mechanized tunnelling systems. As the only company worldwide, Herrenknecht delivers cutting-edge tunnel boring machines for all ground conditions and in all diameters – ranging from 0.10 to 19 meters. Extreme conditions: In depths of up to 106 meters, a 13.6m diameter Mixshield successfully created the first street tunnel beneath the Bosphorus. In the Lake Mead Intake No. 3 project a Herrenknecht Multi-mode TBM bored an intake tunnel for the water supply of Las Vegas under 15 bar water pressure – world record! For Europe's largest railway project Crossrail, six EPB shields and two Mixshields create a continuous rail link through the mega city of London. For the new railway connection Stuttgart-Ulm, two Herrenknecht tunnel boring machines make progress at the Bossler- and Fildertunnel.
HPC Products 24, St Peters Road Bournemouth Dorset BH1 2LN david.kellett@hpcproducts.com 1202298322  Primary Contact David Kellett Technical Sales Manager	10	10			✓	✓	✓	✓	✓	✓	✓	Tunnel Boring Machines, Oils, Greases, Conveyors, Steel Pipes, Ventilation, Ducting, Fans, BUTOR,	HPC Products are agents and distributors for the following products; NFM Tunnel Boring Machines www.nfm-technologies.com Condat Oils and Lubricants www.condat.fr RBL – REI Conveyor Systems www.rblei-france.com Cogemacoustic Ventilation Fans www.cogemacoustic.com Mat Hellas Ventilation Ducting www.mathellas.com Alvenius Steel Pipe Systems www.alvenius.com Metalliance Underground Vehicles www.metalliance-tsi.com Belloli Rockbolts and Anchors www.belloli.ch LVC Knifegate Valves www.knifegatevalves.com Albion Stone Portland Stone www.albionstone.com
Hunter Personnel Ltd Abchurch Chambers 24, St Peters Road Bournemouth Dorset BH1 2LN david.kellett@hunterpersonnel.com 01202 298322  Primary Contact David Kellett Senior Consultant	10	10			✓	✓	✓	✓	✓	✓	✓	Recruitment, Personnel, TBM Personnel	Specialist supplier of personnel to the international tunnelling industry. For over 30 years we have supplied personnel of all levels with Clients, Consultants and Contractors. We supply all types of personnel for the successful completion of large infrastructure projects.


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Hydrowork GmbH Theresienstraße 39 85399 München Germany info@hydrowork.de +49 (0) 81199885766  Primary contact Manuela Späth- Degenkolb Managing Director	31	30			✓	✓	✓	✓	✓	✓	✓	Compressed air interventions work	S-788 U5 Berlin S-550, S-623/624 Guangshengang Tunnel Shenzhen CCCC -Weisan Road River-Crossing Tunnel South, North YMSK - Istanbul Strait Road Tube Crossing Project Crossrail Thames Tunnel-London ARGE Tunnel Weinberg, Zürich ARGE Tunnel XFEL Werkstatt
IBS Mining and Tunneling Industriestr. 15 97653 Bischofsheim a.d. Rhön Germany info@msb-ibs.de 0049 9772 91110  Primary contact Bruce Field Sales Director	100	40			✓	✓	✓	✓	✓	✓	✓	roadheaders, conveying systems and gears, spare and wear parts, general overhaul and repair	For nearly 20 years IBS roadheaders have been proving their value in coal and salt mining as well as tunneling. The 35-ton roadheader SM 130, first delivered in 1995 to Poland and continuously technologically developed, is still the most sought IBS product "made in Germany". The intensive contact to our customers and accurate market monitoring is the basis for continuous adaptation of our machines to the latest technology.
IHC Hytech Elftweg 3 4941 VR Raamsdonksveer The Netherlands info@ihcmerwede.com +31162522202  Primary contact Jaco Kleijwegt Manager Sales	75	25			✓	✓	✓	✓	✓	✓	✓	Main Transfer Shuttles (MTS), Special Decompression Chambers (SDC), hyperbaric living habitats	For more than two decades, IHC Hytech has been actively involved in the design and manufacture of certified decompression/hyperbaric chambers systems, which are installed in tunnel boring machines (TBMs). Not only does IHC Hytech specialise in delivering, for example, man lock chambers (for transfer under pressure), which are integrated in the pressure shield of TBMs. but it is also capable of supplying: complete turnkey packages with man transfer shuttles; decompression chambers; medical chambers; and hyperbaric living habitats, including all auxiliary equipment. In addition to this, IHC Hytech provides life-cycle support for all the systems it supplies.
Inter Techno Commerce ITC SA Rue de la Fusion 122 CH - 1920 Martigny Switzerland info@itcsa.com +41 277222191  Primary Contact Carlo Bretz President	5	5			✓	✓	✓	✓	✓	✓	✓	Tunnel Loading and Heading Machines, Special Equipment for Tunneling and Mining, Tunnel Excavators	ITC SA is a tunnelling equipment designer and supplier. Its application areas are roadway, highway, railway and subway tunnels, and tunnels for hydroelectric schemes, tunnels for sewers as well as tunnels for mining. Starting in 1971, ITC SA has been selling mining and tunnelling equipment to construction yards all over the world. With over 500 machines operating throughout the world, the crawler excavator became a tremendous success, mainly due to an outstanding performance and an ever-evolving concept. The company's strength is the vast wealth of international experience in tailoring its product to match each customer's specific job-site requirement. Every tunnel excavation / loading and rail-track reconstruction is different and has its own specific requirements. Whether in tunnels, in mines or on rails, the ITC team is ready to meet the next challenges.
 Iseki Microtunnelling Airfield Road, Hinwick, Wellingborough, Northants, NN29 7JQ info@isekimicro.com 01234 781 166  Primary Contact Paul Wilkinson General Manager	0	0			✓	✓	✓	✓	✓	✓	✓	Unclemole MTBM/Super MTBM, Jacking Rigs/Interior Jacks, Slurry, Control and Lubrication.	Iseki Microtunnelling are sales distributors for Iseki Poly-Tech and also has a hire fleet of 18 Iseki machines and associated back-up systems for hire. The Iseki Poly-Tech range of equipment has been setting the standards since the 1970's, which continues to lead the field for versatility and reliability. Our unparalleled experience of operating microtunnelling and the unique advantages of the Iseki Systems, makes us at the forefront of Trenchless Solutions.


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	J.H. Fletcher & Co. 402 High Street Huntington, WV 25705 sales@jhlfletcher.com 304-525-7811  Primary contact Ben Hardman VP of Domestic Sales	270	0			✓	✓	✓	✓	✓			✓
Joy Global Inc. Joy Global Inc. Corporate Headquarters 100 E. Wisconsin Avenue, Suite 2780 Milwaukee, WI 53202 conveyors@joyglobal.com +44 776 416 1481  Primary contact Paul Bancroft Product Director		50			✓	✓	✓	✓	✓	✓	✓	Muck and spoil handling from TBM / tunnel excavation to surface storage	Joy Global Inc. is a worldwide leader in high-productivity mining solutions. Through its market-leading P&H and Joy brands, Joy Global manufactures, markets, and services original equipment and support parts for the mining industries. Joy Global's products and related services are used extensively for the mining of coal, copper, iron ore, oil sands, gold, diamonds and other mineral resources.
JP Jensen Ventilation Borgs Väg 7 SE-22355 LUND Sweden peter.dime@jensen-ventilation.com +46706446692  Primary contact Peter Dime Executive Manager	10	10			✓	✓	✓	✓	✓	✓	✓	Flexible Ventilation Ducting	Flexible Ventilation Ducting
KAMAG Transport-technik GmbH & Co. KG Liststr. 3 89079 Ulm Germany info@kamag.com +49 731 4098 0  Primary contact Mr. Fulvio Foti Area Manager Sales	235	10			✓	✓	✓	✓	✓	✓	✓	heavy duty transportation, operating,	KAMAG stands for advanced technology and outstanding product quality in heavy duty transportation. KAMAG develops and produces transporters as modular platform trailers, industrial lift and shipyard transporters as well as vehicles for the tunnel industry.


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	Total	In tunnelling			Africa	Asia	Australasia	Europe	Middle East	North America			South America
	MariMils Oy MariMils Oy Pohjantähdentie 17B FIN-01450 Vantaa - Finland  david.zamora@marimils.fi Tel + 358 207 508 600  Primary contact David Zamora VP Marketing Et Sales	9	4			✓	✓	✓	✓	✓			✓
Mühlhäuser Karl-H. Mühlhäuser GmbH & CO. KG In den Dorfwiesen 23 64756 Michelstadt Germany info@khmte.com +49 6061 70090  Primary contact Paul Zeder COO	86	74			✓	✓	✓	✓	✓	✓	✓	Equip. for Railbound and Tyred transp., Belts, Concreting, Grouting, Injection, Switches, Steelwork	Project specific engineering of transport logistic for tunnelling including the design manufacture and sale of Equipment. Mühlhäuser is involved in the most big tunnel Projects like: - Stuttgart 21 Germany - Kolkata und Chennai Metro - Crossrail London - Riyadh and Doha Metro - Middle River China - Toronto Metro and many others more
NICOLAS Industrie S.A.S 19 Avenue du tertre 89290 Champs-sur-Yonne France  contact@nicolas.fr +33 386 53 52 00  Primary contact Mr. Fulvio Foti Area Manager Sales	185	10			✓	✓	✓	✓	✓	✓	✓	heavy duty Transportation, oparting	NICOLAS stands for advanced technology and outstanding product quality in heavy duty transportation. NICOLAS develops and produces transporters as modular platform trailers, industrial lift and shipyard transporters as well as vehicles for the tunnel industry.
<b>NRC</b> NRC Plant Limited Neagron House, Stanford, Orsett, Essex, RM16 3BX sales@nrcplant.co.uk 01375 361 616  Primary Contact Dave Rees Operations Manager	40	40						✓				Lattice Boom Et Telescopic Boom Crawler Crane Hire	NRC is a long established company specialising in Telescopic and Crawler Crane rentals as well as sales of Hitachi Sumtomo, Linkbelt and Maeda Mini Cranes. The combination of our expertise as crane specialists with the largest range of crawler cranes available for hire and sale in the UK make NRC - the ultimate choice.



Company and contact information	Number of employees		Annual turnover USD (M)	Tunnel turnover USD (M)	Regions company works in							Specialist areas	Company profile
	Total	In tunnelling			Africa	Asia	Australasia	Europe	Middle East	North America	South America		
 <p><b>OPTIMAS</b> Optimas OE Solutions - Sofrasar Tunnel Products 24 rue René François Jolly F-57205 SAR-REGUEMINES tunnel@optimas.com +33387205085  Primary Contact Christophe DELUS Key Account Manager</p>	2000	10			✓	✓	✓	✓	✓	✓	✓	Segment casting	For over 20 years, tunnel infrastructure project owners around the world have come to trust Optimas - Sofrasar Tunnel Products for their fastener solutions - from dowel, bolting and injection systems to anchors and accessories. Our global distribution network and supply chain expertise help to deliver the right solutions when and where you need them.
<p>Philips Lighting High Tech Campus 48 5656 AE Eindhoven The Netherlands steve.ebbrell@philips.com +44 1745 582918  Primary Contact Steve Ebbrell Systems Expert Global - Tunnel Lighting</p>		100			✓	✓	✓	✓	✓	✓	✓	tunnel and road lighting, guidance lighting, total indoor and outdoor lighting specialist	Royal Philips (NYSE: PHG, AEX: PHIA) is a diversified health and well-being company, focused on improving people's lives through meaningful innovation in the areas of Healthcare, Consumer Lifestyle and Lighting. Headquartered in the Netherlands, Philips posted 2014 sales of EUR 21.4 billion and employs approximately 106,000 employees with sales and services in more than 100 countries. The company is a leader in cardiac care, acute care and home healthcare, energy efficient lighting solutions and new lighting applications, as well as male shaving and grooming and oral healthcare.
<p>Pigott Shaft Drilling Hollowforth Hall, Hollowforth Lane, Woodplumpton Preston PR4 0BD info@psdmud.co.uk +44 1772 690076  Primary Contact Adam Beeby Managing Director</p>	21	18	7	4	✓	✓	✓	✓	✓	✓	✓	Slurry Treatment Plants, primary shakers, desanders, desilters and centrifuges.	PSD designs, manufactures and installs worldwide high performing and very reliable separation equipment to the slurry shield tunnelling and pipe jacking industries. We focus on the performance and reliability of the equipment and provide excellent service to our clients. Our aim is always to clean the slurry to the highest standard to maintain rheological properties and to minimise the disposal of waste fluid thereby reducing bentonite and additive consumption.
 <p><b>PROTAN</b> Protan AS Baches Vei 1 3413 Lier Norway pal.fossum@protan.no +4732221680  Primary Contact Paul Fossum Sales Director</p>	700	15			✓	✓	✓	✓	✓	✓	✓	Flexible ventilation ducting. Fits all TBM cassettes	With pride, deliver innovative roofs, membranes, ventilation systems and technical textiles which ensure our customer's value.  Recent projects: Brisbane Legacy Way, Alaska Highway, Alto Maipo, Ryfast, Brenner, Lian Tang, Tuen Mun.

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	Total	In tunnelling			Africa	Asia	Australasia	Europe	Middle East	North America	South America		
<p>REFLEX Unit 4/5, Upper Stalls Iford, Lewes East Sussex, United Kingdom BN7 3EJ reflex@imdexlimited.com +44 1273 405 975  Primary Contact Christian van der Put REFLEX Regional Manager - Europe</p>	132	20			✓	✓	✓	✓	✓	✓	✓	Surveying Core Orientation	REFLEX is the leader in real-time, sub-surface intelligence solutions for the resources industry. REFLEX develops innovative, game changing technologies for drilling, and data collection, management and analysis within the global minerals industry.  REFLEX's technologies are acknowledged for their reliability, ease of use and accuracy and are complemented by unrivalled expertise in geo-scientific data analysis and interpretation. REFLEX HUB is a secure cloud based data management and analysis solution that provides access to relevant, reliable information for critical decision making, anywhere and at any time.  Recent Projects (Civil): London Cross Rail
<p>Rowa Tunnelling Logistics AG Leuholz 15 8855 Wangen SZ Switzerland rowa@rowa-ag.ch +41 55 450 20 30  Primary Contact Jost Wenk Overall Project Manager</p>	30	30			✓	✓	✓	✓	✓	✓	✓	Tunnelling Logistics, Back-ups for TBM, Back-ups for D% B, Project specific Special-Plants	Rowa Tunnelling Logisites AG develops and supplies machinery, equipment and complete systems for underground constructions. As an experienced specialist, Rowa offers efficient and individually adapted Solutions for the construction of tunnels. Rowa is used to pursue, together with the customer, specific Projects from the first conceptual idea to full Performance Operation.
<p>RST Instruments Ltd. 11545 Kingston St., Maple Ridge, BC Canada V2X 0Z5 info@rstinstruments.com 6045401100  Primary Contact Pierre Choquet VP Sales</p>	50	6			✓	✓	✓	✓	✓	✓	✓	Tunnel profile / structural monitoring, monitoring convergence of precast concrete segments.	Since 1977, RST Instruments Ltd. has been manufacturing a complete range of geotechnical and structural instruments for monitoring and assessing the stability of new and existing tunnels.  RST's Tunnel Profile Monitoring System monitors deformation of tunnels and underground openings. The Profile Monitoring System for Tunnel Concrete Segments monitors the convergence of precast concrete segments in TBM-driven tunnels during construction. Please contact RST for more information about other key instruments for monitoring tunnels.
<p>Rutherford Global Power Australia: 39 Laverick Ave, Tomago NSW, 2322 Asia: 8 Boon Lay Way #03-15, Trade Hub 21, Singapore 609964 United Kingdom: 22 Westside Centre, London Road, Stanway, Colchester, Essex contact@rutherfordgp.com +61 (0)2 49 619 619  Primary Contact Steve Rush General Manager - International</p>	99	49			✓	✓	✓	✓	✓	✓	✓	Substations, Switchrooms, Distribution, Transformers, Generators, Cables & t	Rutherford Global Power is the leading provider of electrical hire solutions, electrical packages and temporary/remote power projects for the resource and civil infrastructure industries. We are specialists in commercial arrangements which include, the Hire and Sale of Electrical Equipment needed on operations and projects around the world. Rutherford Global Power have offices in the following locations: Australia: Newcastle NSW and Mackay QLD, United Kingdom, Italy, Singapore, Hong Kong Malaysia

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	Total	In tunnelling	USD (M)	USD (M)	Africa	Asia	Australasia	Europe	Middle East	North America	South America		
<p>Sandvik Construction Kungsbron 1 11122 Stockholm Sweden info.cns@ sandvik.com +46 (0) 8 456 11 00</p> <p>Primary Contact Katri Miss Marketing Com- munication Manager, Tunneling</p>	3000				✓	✓	✓	✓	✓	✓	✓	-	<p>Sandvik Construction is a business area within the Sandvik Group providing solutions for virtually any construction industry application encompassing such diverse businesses as surface rock quarrying, tunneling, excavation, demolition, road building, recycling and civil engineering. Sandvik Construction's comprehensive offering for tunneling includes tunneling jumbos, roadheaders and cutting attachments, bolters, drilling and cutting tools, hydraulic breakers, loading and hauling equipment, mobile crushers, parts and consumables, financing, training, technical support, and repair and rebuild services.</p>
 <p>SELI Technologies Via A. Campanile 73, 00144 Roma, Italy info@selitech.net +390687724200</p> <p>Primary Contact Andrea Imbrenda CFO</p>	26	26	20	20	✓	✓	✓	✓	✓	✓	✓	TBM design, Jobsite technical assistance, TBM overhauling, auxiliary equipment design	<p>Seli Technologies Ltd, established at the end of 2013, inherits the expertise and know-how developed in more than 60 years by the Seli Spa Group in civil works design, special underground equipment design, manufacturing and overhauling (Tunnel Boring Machines, Backup, Rolling stock, etc.)</p>
<p>Senceive Senceive Limited Hurlingham Studios Ranelagh Gardens London SW6 3PA jvernon@senceive.com +44 20 7731 8269</p> <p>Primary Contact Jeremy Vernon Business Development Manager</p>	13	13					✓					Wireless Remote Condition Monitoring, Tilt, Temp, Cameras, Strain Gauges, Piezometers, Load Cells	<p>Senceive supply high precision tilt sensors to the rail and construction market. Utilising our wireless platform we achieve outstanding reliability, robustness and repeatability on a variety of sensors.</p> <ul style="list-style-type: none"> <li>* 15 years of battery life</li> <li>* Wire and Power Free</li> <li>* LU type approval and NR accepted</li> <li>* Precise/Stable data @ 0.053mm/m</li> <li>* Highly Cost effective and re-deployable</li> <li>* 1000's of units deployed/10 years of success</li> <li>* Simple alerts/triggers</li> <li>* Easy to use data visualisation</li> <li>+ Many other features</li> </ul> <p>Intelligence and decision making at node level. Trackbed, Tunnels, Retaining walls and Structures, Earthworks and Embankments</p>
<p>SICK AG SICK AG Erwin-Sick-Str. 1 79183 Waldkirch www.sick.com info.pa@sick.de +49 7681 202-0</p> <p>Primary Contact Christoph Seewald Strategic Industry Manager Traffic</p>	7000	30			✓	✓	✓	✓	✓	✓	✓	Traffic systems for roads, railways and tunnels. Visibility, smoke, gases, air flow, height control.	<p>SICK offers efficient solutions for traffic systems. The Tunnel sensors from SICK are designed especially for use in tunnel applications. We offer a complete range of tunnel air monitoring devices, stand-alone sensors or combined versions. SICK tunnel sensors are installed in over 800 road and train tunnels world wide.</p>

Company and contact information	Number of employees		Annual turnover	Tunnel turnover	Regions company works in							Specialist areas	Company profile
	Total	In tunnelling	USD (M)	USD (M)	Africa	Asia	Australasia	Europe	Middle East	North America	South America		
 <p>Specialist Plant Associates Limited Airfield Road, Hinwick, Wellingborough, Northants, NN29 7JQ info@specialistplant.co.uk 01234 781 882</p> <p>Primary Contact Ian Matthews Director</p>	20	20			✓	✓	✓	✓	✓	✓	✓	Ventilation systems, Grouting equipment, Shaft jacking systems, Compressed Air equipment and more.	<p>Specialist Plant is the leading Equipment hire and engineering service supplier throughout the UK and Internationally. We offer our customers unrivalled support and guidance with their hire purchase and offer next day delivery. Our main priority is giving our customers quality assurance that meets demands; therefore all of our equipment is robust, safe and built to last!</p>
<p>SWEDVENT Technologies AB Fabriksgatan 25 S-41250 Goteborg SWEDEN bo@swedvent.se +4631845300</p> <p>Primary Contact Bo Stromsholm CEO</p>	25	25	15	15	✓	✓	✓	✓	✓	✓	✓	Tunnelling ventilation, mining ventilation, ventilation surveys	<p>Since the Company was established in 1995, SWEDVENT Technologies AB has manufactured and supplied it's complete ventilation system to more than 2.000 tunnelling projects worldwide. The complete ventilation system comprise high pressure tunnelling/mining fans, flexible ducting and tunnelling ventilation design which is delivered to contractors/mines with a full responsibility for the performance of the vent system operating at site.</p> <p>One recent major tunnelling project where SWEDVENT delivered the complete ventilation system was the hydropower project Baihetan in Sichuan province, China which is said to be the worlds largest underground hydropower project in terms of generated power. A total of 120 larger tunnelling fans and 150 km of flexible ducting was delivered in 2014. The design of the overall construction ventilation was done by SWEDVENT.</p>
<p>Team Mixing Technologies 1A-30528 Great Northern Ave Abbotsford, BC, V2T 6H4 Canada treschke@teammixing.com +16045567225</p> <p>Primary Contact Tony Reschke Manager</p>	25	25	7	2	✓	✓	✓	✓	✓	✓	✓	Bi-component grout plants, pumps, concrete and shotcrete plants	<p>Team Mixing Technologies has been engineering and manufacturing batch plants and related systems for over 25 years. We have in-house mechanical and controls engineers including technical field personnel with experience in all aspects of the project from project design through to final commissioning and operator training. With extensive experience in concrete, shotcrete and bi-component batch plants, our engineering department, fabrication facility, and controls department works closely with clients to provide the best overall value and quality of equipment.</p>

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	Total	In tunnelling	USD (M)	USD (M)	Africa	Asia	Australasia	Europe	Middle East	North America	South America		
 <p>TERRATEC 171 Davey Street, Hobart, Tasmania 7000, AUSTRALIA info@terratec.co + 61 362233282</p> <p>Primary Contact n/a n/a</p>	238	182	86	68		✓	✓	✓	✓	✓	✓	Tunnel Boring Machines, Raise Boring Machines, Conveyor Systems Et other customised equipment	Incorporated in 1990, TERRATEC is the renowned Australian designer and manufacturer of Tunnel Boring Machines (TBM) and Raise Boring Machines (RBM). The Company also supplies Conveyor Systems and other ancillary equipment and accessories to support the tunnelling and mining works. Having its main quarters and engineering centre in Australia, TERRATEC has other six wholly own subsidiaries strategically located in different regions through the globe to attend the demand of tunnelling and mining equipment worldwide. At present, there are over 30 TERRATEC boring machines working in tunnel and mine sites across 5 continents.
<p>TNO DIANA Delftechpark 19a Delft 2628 XJ The Netherlands info@tnodiana.com 0031 (0) 88 34262 00</p> <p>Primary Contact Steve Owen Commercial Director</p>	27	27			✓	✓	✓	✓	✓	✓	✓	Finite element analysis of interaction between tunnels/structures and surrounding environment.	TNO DIANA is the owner and developer of the renowned finite element analysis software, DIANA, that has been utilised worldwide within the tunnelling industry for many decades and also provides consultancy services utilising DIANA. The program specialises in the analysis of a wide range of new and existing underground structures, tunnels and tunnel linings under the effect of settlement, additional loads and structural damage including seismic, freezing, flood and fire. DIANA is also used extensively in the analysis of soil and structure interaction.  Joints and tunnel segments can be modelled individually or together with associated soil/grout pressures and additional loads, that produce precise 2D or 3D output.
<p>Trelleborg Engineered Products Verlengde Kerkweg 15, 2985 AZ Ridderkerk, The Netherlands engineeredproducts@trelleborg.com +31 180 495 555</p> <p>Primary Contact Andre de Graaf Sales Manager</p>	600	75		20		✓		✓	✓	✓	✓	Gina seal, Omega gasket, Waterstops, Tunnel Segment Gaskets	Trelleborg is one of the largest producers of technical rubber products in the world. Trelleborg Infrastructure designs and produces tunnel sealing systems. We are the global market leader of Gina and Omega seals for immersed tunnels. For bored tunnels we supply our Tunnel Segment Gaskets. And for all types of tunnels we also supply the best (injectable) waterstops available in the market. Our leading positions are based on cutting-edge expertise in polymer technology combined with excellent application know-how.
<p>Tunnel Sensors Furlong House Crowfield Brackley Northants NN13 5TW UK sales@tunnelsensors.com +44 1280 850521</p> <p>Primary Contact Paul Jones Director</p>	9	9	2	2	✓	✓	✓	✓	✓	✓	✓	Monitors, sensors and instrumentation for ventilation and lighting control in tunnels	Tunnel Sensors manufactures our own range of air pollution sensors and analysers designed specifically for use in the tunnel environment. We offer a complete range of tunnel air monitoring sensors for measuring visibility and dust, CO, NO, NO2, air speed and direction as well as tunnel luminance and illuminance, all designed to meet the demands of the harsh environmental conditions.

Company and contact information	Number of employees		Annual turnover	Tunnel turnover	Regions company works in							Specialist areas	Company profile
	Total	In tunnelling	USD (M)	USD (M)	Africa	Asia	Australasia	Europe	Middle East	North America	South America		
 <p>The Robbins Company 29100 Hall Street Solon, Ohio 44139 USA sales@robbsntbm.com +1 4402483303</p> <p>Primary Contact Amey Yong Marketing Manager</p>	800	800	200	200	✓	✓	✓	✓	✓	✓	✓	Tunnel boring machines, small boring equipment, conveyors, cutters, field service, technical support	The Robbins Company had led the tunneling industry for over six decades since the design and development of the world's first modern-day tunnel boring machine in 1952. Today, Robbins continues to be an innovative supplier, with machines on projects spanning the globe.  Robbins' latest innovation is the Crossover series of TBMs, a set of field-tested dual-mode type machines. These TBMs can "cross over" between modes, allowing them to tackle tunnels that previously would have required multiple machines.  The three types of Crossover TBMs are: XRE (Crossover between Rock/EPB), XSE (Crossover between Slurry/EPB), and XRS (Crossover between Rock/Slurry).
 <p>Tunnelling Accessories Sidney Little Road Churchfields Industrial Estate St Leonards-on-Sea East Sussex TN38 9PU info@tunnellingaccessories.co.uk +44 1424 854112</p> <p>Primary Contact Philip Benford Managing Director</p>	12	12	1.2	1.2	✓	✓	✓	✓	✓	✓	✓	Segmental tunnel fittings and Packers	We are manufacturers, distributors and Agents for a variety of different products used in the construction of tunnels. We operate all over the world through agents and have supplied the following projects:- Crossrail, Thames Tideway, Seattle, Singapore Metro, Grosvenor Mine Project, Brisbane, Panamar, City West Cable Tunnel Sydney, Central subway Tunnelling Project - San Francisco, Port Mann Tunnel
<p>Vermeer UK 45 - 51 Rixon Road Wellingborough Northamptonshire NN8 4BA sales@vermeeruk.co.uk +44 1933 274400</p> <p>Primary Contact Matthew Izzard Trenchless Technology Manager</p>	20	20						✓				Directional Drilling, AXIS Guided Boring, Impact Molding, Vacuum Excavation, Trenchers	Vermeer UK distribute and support the range of Vermeer equipment to contractors involved with HDD. This includes both service and parts as well as project assistance when challenging conditions are encountered.
<p>VMT GmbH Stegwiesenstrasse 24 76646 Bruchsal Germany info@vmt-gmbh.de +49 7251 9699 0</p> <p>Primary Contact Alexander Seilert Head of Sales &amp; Project Management</p>	244	244			✓	✓	✓	✓	✓	✓	✓	Tunnel guidance, industrial measurement, geomonitoring, data collection and management	More than 1,000 successfully completed tunneling projects confirm the performance of the VMT product and service portfolio that comprehensively supports all parties involved in each phase of a project.  Safety and efficiency in tunnelling require highest precision and optimum process management. Construction companies rely on VMT products to help create tunnels and shafts of any size and for various infrastructure or mining applications. Navigation systems for tunnelling machines as well as innovative network solutions for communication, information and monitoring play key roles in this field. All VMT products can either be used as stand-alone solutions or can be combined smartly to integrated, customized workflow systems that manage information, connect technologies and monitor processes within the tunnel and between all other locations involved - even worldwide.

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# MATERIALS

The alphabetical list of material manufacturers in the tunnelling industry,  
as collected by the *Tunnels and Tunnelling* survey

Company and contact information	Number of employees		Annual turnover USD (M)	Tunnel turnover USD (M)	Regions company works in							Specialist areas	Company profile
	Total	In tunnelling			Africa	Asia	Australasia	Europe	Middle East	North America	South America		
A.S.T. Bochum Kolkmannskamp 8 D-44879 Bochum Germany info@astbochum.de +492345996310  Primary contact					✓	✓	✓	✓	✓	✓	✓	Flexible Hoses, Steelpipes, Fittings, Accessories, Worldwide express deliveries; personal advice	We are an owner-operated company with direct decision-making paths and with highly qualified staff. Our extensive range of products and service tailored to our clients needs ensure that we offer comprehensive service from a single source. Direct access to more than 10.000 items in our main storage building in Bochum, Germany Projects : Gotthard base tunnel, Niagara Hydro-electric scheme, Copenhagen Metro, Rohtang pass Highway tunnel, Smart tunnel, Westerschelde tunnel, Citytunnel Malmö, Tunnel Wienerwald, High speed railway tunnels Germany, Prague Metro, and many more, approximately more than 400 smaller tunnels
ABC Ventilation Systems 1802 Quebec Avenue, Saskatoon SK, Canada info@abcventilation.com +13066534303  Primary contact Gary D Thorinson Director - International Marketing	200	100			✓	✓	✓	✓	✓	✓	✓	Underground Ventilation, Cooling, Heating, Dust Removal, Ducting (Lay-flat Et Hardline), Fans	ABC Ventilation Systems is the world leader in underground ventilation products. ABC has close to 50 years in the industry and reference projects in over 52 different countries. With offerings such as Ducting, Fans, Deduster's, Make-up Air Units, Controls, and Sensors ABC can truly supply the full turn-key ventilation package.
ABG Ltd E7 Meltham Mills Rd Meltham West Yorkshire HD9 4DS technical@abg ltd. com 01484 852096  Primary contact Martin Lambley Marketing Manager	53	10			✓	✓	✓	✓	✓	✓	✓	Tunnel drainage, geotextiles	ABG are a market leader in the development of high-performance geosynthetics for use in wide range of civil engineering projects.  Cavidrain is a preformed geocomposite designed to relieve hydrostatic pressure encountered in the construction of tunnel wall systems. The larger void Cavidrain has been used extensively in the drainage of tunnel inverts offering a cost effective sustainable alternative to traditional pipe and gravel techniques.  Major projects include Liberty Way Tunnel - Melbourne, Young Dong Tunnel - Korea, Gautrain Tunnel - South Africa and Chi Ma Wan Cable Tunnel - Hong Kong.
Agir Aggregat AG Agir Aggregat AG Alte Obfelderstrasse 55 CH-8910 Affoltern a.A. Switzerland aggregat@agir.biz 0041 44 762 44 22  Primary contact Carl Wassermann Head Acquisition	300	75			✓	✓	✓	✓	✓	✓	✓	Mucking, conveying, material logistics, screening, crushing, water treatment	Agir supplies and operates the complete package of material logistics for tunneling from TBM or drill-and-blast heading to the landfill or railway/ship/truck loading.

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	Total	In tunnelling			Africa	Asia	Australasia	Europe	Middle East	North America	South America		
Alvenius Kungsgatan 75 lars.bergstrom@alvenius.se +46 16 166500  Primary contact Lars Bergström Export Manager	50	50			✓	✓	✓	✓	✓	✓	✓	Pipe systems and solutions, Quick couplings, Water supply, Corrosion protection, Special pipes	Alvenius is a Swedish manufacturer of steel pipe systems, with more than 60 years experience from supply to tunnelling and construction projects around the globe. Important advantages of the Alvenius pipe system: high quality, low weight/quick installation, corrosion protection, energy efficient pumping of media. Recently supplied 80km of galvanized pipes and fittings to the Crossrail project in London.
ArcelorMittal Bissen Route de Finsterthal L-7703 Bissen G.D. of Luxembourg s.mathieu@arcelor-mittal.com +352 621234062  Primary Contact Stephane MATHIEU Senior Technical Officer Underground Solutions	400	80			✓	✓	✓	✓	✓	✓	✓	Steel fibres for concrete, shotcrete, reinforcement for tunnel lining segments, precast elements..	ArcelorMittal is one of the leading steel fibres suppliers providing safe, sustainable and cost effective construction solutions for industrial, residential and civil construction markets. Our technical and sales teams offer comprehensive services throughout the world with customized support to all involved in the design, specification and installation of steel fibre reinforced concrete. Today we are present in more than 25 countries providing the latest technology on steel fibre reinforced concrete projects.
Avancia Engineering Enterprises 201-GTH Building -Al Salam St. Abu Dhabi-UAE avancia@avancia.ae +97126222534  Primary Contact Asem Abdelrazeq Sales and marketing Manager	10	10						✓				Fire Protection solutions for Road, Rail and Metro Tunnels as per Rijkswaterstaat, RWS Curve	Road Tunnels -Al Salam Street Tunnel in Abu Dhabi, U.A.E. -Bypass M-30 Tunnel in Madrid, Spain -Al Ras Al Akhdar Tunnel in Abu Dhabi, U.A.E. -Baynoolah Street Tunnel in Abu Dhabi, U.A.E. -Marina Coastal 482 Tunnel in, Singapore  Tunnels and underground stations -Barcelona's Underground Barcelona, Spain -Malaga Underground Malaga, Spain -T4 Local Train Station in Madrid, Spain -Metrosur Tunnel in Madrid Spain  Airport -Midfield Terminal Tunnel in Abu Dhabi, U.A.E. -Al Etihad International Airport in Abu Dhabi, U.A.E.  Other Tunnels - Football Stadium, New entrance Tunnel, U.A.E.
 Bekaert Maccaferri Underground Solutions SkylinE 40 Korte Keppestraat 21/02 9320 Erembodegem - Aalst Belgium contact@bm-underground.com +32 53 43 10 10  Primary Contact Sofie Wijmeersch Marketing Communications Officer	45	45			✓	✓	✓	✓	✓	✓	✓	Fibres and Chemicals for Shotcrete, Precast Segment Accessories, Tubular Steel Arch Support System	Bekaert Maccaferri Underground Solutions, your global partner for smart reinforcement of your tunnelling and mining project. At Bekaert Maccaferri Underground Solutions, we have a team of technical experts available, especially dedicated to the underground construction world. Our high quality product portfolio is unique and sets a new standard. Bekaert Maccaferri Underground Solutions offers you a full service: technical guidance, project feasibility, reliable delivery, on-site assistance, customized equipment and consistent flow of high-quality products. We optimize your project, by providing innovative, more cost-effective and safer solutions. Via an increased local presence and global production capacity, our highly skilled technical team can respond quickly to your needs and requirements. Bekaert Maccaferri Underground Solutions understands you. Because we are tunnelling.

Company and contact information	Number of employees		Annual turnover	Tunnel turnover	Regions company works in							Specialist areas	Company profile
	Total	In tunnelling	USD (M)	USD (M)	Africa	Asia	Australasia	Europe	Middle East	North America	South America		
<p>BESSAC ZI de la Pointe 31790 Saint Jory France csmbessac@csmbessac.com +33 5 61 37 63 63</p> <p>Primary Contact B. THERON CEO</p>	300	300	90	90	✓	✓	✓	✓	✓	✓	✓	TBM operation MTBM operation Tunneling equipment design & manufacturing	<p>CSM BESSAC, a worldwide major microtunneling contractor, presents 40 years of experience on tunnel and microtunnel projects. CSM BESSAC masters all mechanized excavation techniques (microtunneling, EPB TBM, Slurry TBM, air pressurized TBM) and has over 100 km of microtunneling and tunneling experience in about 100 projects in last 5 years. These works were realized in 20 countries on five continents. CSM BESSAC is ISO 9001, OHSAS 18001 and ISO 14001 certified.</p>
<p>Buchan Concrete Walton Road Drakelow Burton On Trent Staffordshire UK DE15 9UA info@buchanconcrete.co.uk +44 1283 477013</p> <p>Primary Contact Dave Derbyshire Underground Products Manager</p>	375	25	60	12			✓	✓		✓		Segment Casting	<p>Buchan Concrete is one of the largest pre-cast concrete providers in the UK. Buchan operates from its administrative headquarters and main factory at Byley near Middlewich in Cheshire, with further manufacturing facilities at Drakelow, near Burton on Trent, Staffordshire.</p> <p>The company offers a range of standard products for the civil engineering and utilities industries, including tunnel lining and shaft segments.</p> <p>Recent UK Tunnelling contracts include National Grid Cable London, Heathrow T5 Baggage, DLR and Jubilee Underground and Thames Water Tunnels. Buchan has also supplied complete packages including moulds, fittings and technical assistance to contracts in Brisbane Australia, Seattle USA and Toronto Canada. Technical assistance has also been provided to a manufacturer in Singapore.</p>
 <p>CEMEX CEMEX Specialised Silo Solutions Evreux Way Rugby Warwickshire CV21 2DT gbdrysilomortar@cemex.com 01926 811133</p> <p>Primary Contact Virginia Spencer Sales Office Team Leader</p>	3500	25						✓				Spray Concrete, Grouts	<p>CEMEX operates a comprehensive national supply network to ensure that quality materials and services are available to customers locally.</p> <p>Holding the enviable position as market leader in concrete including Spray concrete and a leading supplier of mortars and screeds, our reputation for reliability and unrivalled technical expertise has been built up over 80 years serving the UK construction industry. Nationwide the company operates over 230 concrete mixing plants to ensure efficient delivery to virtually any location in the UK.</p>
<p>Cmp International Inc. 200 Vanda Drive Maple, Ontario L6A 4E5 Canada cmp@cmpcanada.com +1 416 623 6671</p> <p>Primary Contact Maria Yu President Assistant</p>	20	5				✓	✓	✓		✓	✓	Self Drilling Anchor Bolt and Fibre Glass Products for tunneling, mining and construction.	<p>CMP International Inc. is registered in Ontario, Canada, serves the world in the area of rock &amp; soil support &amp; reinforcement technology; Supply quality hollow bar systems and GRP products that are made by its manufacture base in China, who are certified factory according to ISO9001:2008 to our global client with a competitive price; Research and develop new ground support &amp; reinforcement technology our client need; Produces technical support &amp; assistance and advice;</p>


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<p>Compcos Fire Systems Cleeve House, Malvern Road, Worcester, WR2 4YX enquiries@compcos-fire.co.uk 01905 741600</p> <p>Primary Contact John Sinclair Managing Director</p>	415	100	33	1								Design, supply, installation and maintenance of Automatic Fire Sprinkler systems.	<p>For over 27 years, COMPCO has been at the forefront of protecting people and property from fire. As the UK's largest independently owned fire-engineering company, COMPCO has the expertise, resources and stability to meet the needs of clients and projects of any scale. From a project-managed installation to servicing and maintenance, we will tailor our services to the exact requirements of your project. With a broad experience in all fire-protection technologies, we will make sure you benefit from the most suitable solution for your needs. We have a long list of clients that have selected us to protect them from fire. These include landmark locations such as the British Museum, Royal Ascot and the Millennium Stadium, and blue chip companies such as IBM, IKEA, Honda and Rolls Royce.</p>
<p>Compressed Air Work Zengerstr. 11a 85399 Hallbergmoos Germany info@compressed-air-work.net +49(0)811 99885766</p> <p>Primary contact Peter Späth Managing Director</p>	3	1			✓	✓	✓	✓	✓	✓	✓	Compressed Air Intervention System	<p>S-788 U5 Berlin S-550, S-623/624 Guangsheng Tunnel Shenzhen CCCC -Weisan Road River-Crossing Tunnel South, North YMSK - Istanbul Strait Road Tube Crossing Project Crossrail Thames Tunnel-London Arge Tunnel Weinberg, Zürich ARGE Tunnel XFEL Werkstatt</p>
<p>CONDAT 104 Avenue Frédéric Mistral 38670 Chasse-sur-Rhône info@condat.fr +33478073838</p> <p>Primary Contact Mr Laurent DEBORD Tunnelling Business Unit Manager</p>	290	50	91	34	✓	✓	✓	✓	✓	✓	✓	Tail seal greases, sealing products, fire resistant hydraulic fluids, Foaming agents, lubricants	<p>Since 1989, Condat has developed a complete range of products, lubricants and additives fulfilling technical, safety and environmental requirements for underground works with TBM such as: Tail seal greases, Main bearing sealing product, Greases, Biodegradable and fire resistant hydraulic fluids, Foaming agents and polymers, Additives for filling grout, Additives for ground consolidation... CONDAT is the worldwide unique supplier to offer a complete range of biodegradable and self-extinguishing products dedicated to TBM. A technical team is especially dedicated to the good use of these products on any type of TBM worldwide.</p>
<p>Cooper &amp; Turner Ltd Templeborough Works Sheffield Road Sheffield S9 1RS South Yorkshire England United Kingdom sales@cooper-andturner.co.uk +441142560057</p> <p>Primary Contact Richard Grieve Tunnelling Sales Manager</p>	150	5	100	5	✓	✓	✓	✓	✓	✓	✓	Connection Assemblies, embedded accessories for segmentally lined tunnels	<p>Cooper &amp; Turner Ltd are designers, manufacturers and suppliers of connection and embedded accessories for concrete segmentally lined tunnels. Recent projects include: USA - L.A. Metro Regional Connector USA - First Tunnel USA - Silver Lake USA - Northgate Link N125 USA - San Francisco Central Subway Singapore - JIPCT TC130113 Singapore - Thomson Line T216 Singapore - Thomson Line T220 Hong Kong - Cross Harbour Strategic Relief Sewer Australia - Brisbane Airport Tunnel Link</p>


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<p>CPM Group Mells Road, Mells, Somerset BA11 3PD sales@cpm-group.com +44 1179 812791</p> <p>Primary contact Louise Chouhan-Hodges Marketing Manager</p>	270	20			✓	✓	✓	✓	✓	✓	<p>Manufacture of precast drainage products, pipes, chamber rings, caissons, culverts, tank systems</p> <p>CPM is a leading manufacturer of precast concrete products with extensive facilities across the UK and a comprehensive catalogue of sustainable precast products that are supplied to every sector of the construction industry</p>	
<p>Daeryong Industrial co. 52A, Jalan Anggerik Vanilla Z 31 / Z, KOTA Kemuning, Shah Alam, Selangor, 40460, Malaysia Ijung Bldg, 2F, 84-12, Yangjae-Dong, Seocho-Gu, Seoul, Korea office@daeryong.asia +60351216110</p> <p>Primary contact John Martin Director</p>	75	50			✓	✓	✓	✓	✓	✓	<p>Manufacturers of EPDM gaskets and hydrophilic water-stops for underground concrete systems</p> <p>- Manufacturers since 1989 - One of the few companies who have obtained product certification and warranty for 120 years lifetime performance of product - Recent projects include cable tunnels in Singapore and several projects in many parts of the world (Malaysia, Hong Kong, India, Korea, Vietnam)</p>	
<p>Datum Monitoring Datum Monitoring Datum House The Pavilions Bridge Hall Lane Bury Lancashire BL9 7NX info@datummonitoring.com 0161 7975511</p> <p>Primary Contact Nick Mahon Estimating Manager</p>	105	30	12	2.5	✓	✓	✓	✓	✓	✓	<p>Supply of Instrumentation, Supply of monitoring services</p> <p>Datum design, manufacture, install and operate automated in-tunnel monitoring systems. Examples of recent projects include: Instrumentation and Monitoring Contract C405 - Crossrail Instrumentation and Monitoring Contract C305 - Crossrail</p>	
<p>Drägerwerk AG &amp; Co. KGaA Moislinger Allee 53-55 23558 Luebeck, Germany info@draeger.com +49 451 882-0</p>		300			✓	✓	✓	✓	✓	✓	<p>Tunneling</p> <p>Dräger is an international leader in the fields of medical and safety technology. The family-owned company was founded in Lübeck, Germany, in 1889. Over the past five generations, Dräger has evolved into a publicly traded, worldwide group. The company's long-term success is based on the four key strengths of its value-driven culture: customer intimacy, professional employees, continuous innovation and a commitment to outstanding quality. Emergency response services, law and regulatory enforcement and the industry trust in Dräger's integrated hazard management, in particular for personal protection and plant safety. This includes: respiratory protection equipment, stationary and portable gas detection systems, professional diving equipment and systems, as well as alcohol and drug impairment detection.</p>	


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<p>DTS Equipment 20 Broadwick Street, London, W1F 8HT m.dyakonyuk@dne- protechservice.com +442036088040</p> <p>Primary contact Maxym Dyakonyuk CEO of UK Branch, Sales VP</p>	5700	900			✓	✓	✓	✓	✓	✓	<p>Cast iron and steel lining production.</p> <p>Foundries in Ukraine, trade offices in Ukraine, UK, USA &amp; Russia. 80 year of experience, more than 580 000 tons of lining delivered for the last 25 years.</p> <p>Turn-key cycle from engineering to production and delivery.</p>	
<p>E-Berk Tunnel &amp; Foundation Technologies Anadolu Organize Sanayi Bolgesi 29 Ekim Cd. No:3 Temelli / ANKARA e-berk@e-berk.com +903122674848</p>	160	95	10	8		✓		✓	✓		<p>TBM Operation, TBM Manufacturing, TBM Overhauling</p> <p>E-Berk Machine and Metallurgy has been serving to Turkish Metal Industry since 1993, moreover E-Berk Machine and Metallurgy's activities have been continuing with providing Tunnel Boring Machines' spare parts and cutter head revisions since 2002.</p>	
<p>Elasto Plastic Concrete Citywest Business Centre, 3013 Lake Drive Citywest, Dublin 24, Ireland gsedgman@elasto-plastic.com +353 (0) 1 469 3197</p> <p>Primary contact Geoff Sedgman Marketing Manager</p>	25	20			✓	✓	✓	✓	✓	✓	<p>Synthetic fibre reinforcement, shotcrete and concrete mix design and processes, ground support</p> <p>Elasto Plastic Concrete is a the leading provider of Synthetic Fibre Reinforcement Solutions. Our team comprises industry leaders focused on delivering the best solution to our clients and providing state of the art advice on shotcrete and concrete, synthetic fibre reinforcement and finite element analysis designs.</p> <p>EPC's focus on the development of high performance structural synthetic fibre is recognised the world over. A fact highlighted by EPC's nomination at the 2012 and 2013 ITA Awards for Tunnelling Excellence.</p>	
<p>Elkem Silicon Materials 17 Jessops Riverside Brightside Lane Sheffield S9 2RX</p> <p>www.concrete.elkem.com +44 (0)114 2700334</p> <p>Primary contact John Finch Commercial Manager</p>	1500	120			✓	✓	✓	✓	✓	✓	<p>Suppliers of Microsilica slurry and powder for tunnelling and grouting applications</p> <p>Elkem Silicon Materials is one of the world's leading suppliers of metallurgical silicon. We deliver special products to customers in the chemicals, electronics and aluminium industries worldwide.</p>	



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<p>fermacell AESTUVER Düsseldorfer Landstraße 395 47259 Duisburg Germany info@xella.com +49203608803</p> <p>Primary contact Robert Brkljacic Head of International Projects</p>	697	10			✓	✓	✓	✓	✓	✓	✓	<p>Fire-protection boards for underground transport systems, Fire-protection cable ducts,</p>	<p>Fermacell AESTUVER products are high performance boards for fire prevention. AESTUVER fire protection boards are class A1 rated, the highest possible classification. Beside the non-combustibility the cement-bonded, fibreglass-reinforced board is at the same time water and frost resistant, extremely durable, impact resistant and is easy to install. The board is perfectly suited for the protection of escape routes and emergency exits in the event of fire as well as for tunnel, plant room and underground construction. AESTUVER fire-protection boards fitted to concrete surfaces in underground transport systems reliably protect the concrete against fire-induced stressing up to the conditions of the RWS time-temperature curve, with peak temperatures of up to 1,350 °C (product-specific), also preventing concrete sloughing and spalling.</p>
<p>FOGTEC Fire Protection FOGTEC Brandschutz GmbH &amp; Co. KG Schanzenstrasse 19A D-51063 Köln (Cologne) Germany contact@fogtec.com +49 221 96223-0</p> <p>Primary contact Max Lakkonen General Manager - Tunnel Systems</p>	120	25			✓	✓	✓	✓	✓	✓	✓	<p>Water mist systems, water spray systems, consultancy, risk analysis, fire tests, RAMS analysis, SIL2</p>	<p>FOGTEC is the leading specialist for the design and installation of active fire fighting systems (high pressure water mist and water spray systems) for tunnels and subsurface facilities. FOGTEC's fire fighting systems have been approved in more than 200 full scale tunnel fire tests. FOGTEC has participated in well-known tunnel safety research projects like FIT, UPTUN and SOLIT / SOLIT². FOGTEC's high pressure water mist systems are protecting various high profile tunnels and underground facilities such as the Virgolo Tunnel (Bolzano, Italy), M30 Tunnel (Madrid, Spain), New Tyne Crossing (Newcastle, UK), Eurotunnel (Channel Tunnel, France / UK) and the Dartford Crossing (London, UK). The scope of FOGTEC's works includes consultancy, fire testing, risk analysis, design, installation, project management, RAMS analysis, SIL2 control systems, SCADA systems, detection systems and maintenance.</p>
<p><b>MC</b> FP McCann</p> <p>FP McCann Ltd Brascote Lane Cadeby Nuneaton Warwickshire CV13 0BB scarson@fpmccann.co.uk 1455290780</p> <p>Primary contact Stuart Carson National Sales Manager Tunnelling, Rail and Power.</p>	780	80			✓	✓	✓	✓	✓	✓	✓	<p>Smoothbore Shaft, Tunnel Linings, Cover and Landing Slabs, Caisson Shaft Units, Jacking Pipes</p>	<p>The FP McCann range of shaft and tunnel products has been developed to meet the requirements of the latest industry standards which include the British Tunnelling Society Specification and the Civil Engineering Specification for the Water Industry. Designed with consideration to the ease of construction and speed of installation, the FP McCann shaft and tunnelling systems offer strength, stability and overall performance in all types of ground conditions.</p> <p>Tunnel and shaft products are manufactured in accordance with FP McCann's quality management system, BSI accredited to BS EN 9001.</p>
<p>Fortius-B.K.International grasbos 50 B3294 Diest Belgium info@fortius.be +32 13326873</p> <p>Primary Contact Bert Kriekemans CEO</p>	5	2	1				✓	✓				<p>Supply of FRP reinforcement and fibers</p>	<p>Supply of FRP reinforcement and fibers</p>

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<p>Grace Construction Products Grace Construction Products (UK Head Office). 580-581 Ipswich Road Slough Berkshire SL1 4EQ www.graceconstruction.com +44 (0)1753 490000</p> <p>Primary contact Richard Young Business Development Manager</p>	2000	20			✓	✓	✓	✓	✓	✓	✓	<p>Concrete admixtures, Macro synthetic fibres, Water proofing, fire proofing, grouts and mortars.</p>	<p>Founded in 1854 Grace is a worldwide leader in the construction products industry. The Grace combination of innovative products, a specialized sales force for each product line, sophisticated research and development, technical service and support at the job site - delivers added value that is unprecedented in the industry.</p>
<p>GUMBA-LAST PoB 1307 D 85627 Grasbrunn Germany info@gumba-last.de ++49 89 461460</p> <p>Primary contact Export Dept Export Dept</p>					✓	✓	✓	✓	✓	✓	✓	<p>Elastomeric Waterstop Systems Worldwide Standard DIN 7865</p>	
<p>HALFEN Liebigstrasse 14 40764 Langenfeld Germany info@halfen.com +49 (0) 2173/970-0</p> <p>Primary Contact Ivica Duzic Project Manager Tunnelling &amp; Civil Engineering</p>	1100	10	217		✓	✓	✓	✓	✓	✓	✓	<p>Concrete anchoring and fixings</p>	<p>HALFEN is a global supplier of concrete anchoring and façade fixing systems for use in pre-cast elements, commercial and residential construction, as well as for civil engineering, transport and infrastructure applications. HALFEN channels will enable adjustable connections to the pre-cast tunnel lining segments for the overhead supports line. Preassembled in the pairs with spacers and short-circuit-proof connections, curved to the radius of the lining, they avoid the hazards of dust and noise associated with drilling confined spaces. HALFEN channels are used worldwide in both the inner and final lining of NATM tunnels, and the segmented pre-cast linings of TBM tunnels. The product involves no drilling, no damage to earthing, reinforcement of concrete, and this time saving.</p>
<p>HaloSource, Inc. 1725 220th St SE, Ste 103 Bothell, WA 98021 info@halosource.com 425-881-6464</p> <p>Primary Contact Tricia Testa Sales Operations Manager</p>	110	5			✓					✓	✓	<p>Water treatment</p>	<p>HaloSource, Inc. designs solutions that serve people, preserve the planet, and protect our most valuable resource - water. The company works with scientists and industry experts in search of new ways to improve water quality around the globe. The team of HaloSource chemists, biochemists and microbiologists hold more than 100 patents, giving the company the power to provide environmentally conscious solutions. The company's mission is to make water better and help return previously contaminated water into the environment in the most clean, natural pure state.</p>


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 <p><b>HOBAS®</b> HOBAS GRP Pipe Systems Pischeldorfer Strasse 128, 9020 Klagenfurt, Austria info@hobas.com +43 / 463 / 48 24 24</p> <p>Primary Contact Jessica Maier Marketing</p>	1000	1000			✓	✓	✓	✓	✓	✓	✓	Curved pipe jacking, pressure jacking, very long drives, high hygienic and/or ecologic requirements	HOBAS is a leading worldwide manufacturer and supplier of high-performance centrifugally cast GRP (Glassfiber Reinforced Plastics) pipe systems with a patented manufacturing process. Since the 1950s, the international HOBAS Group has produced and marketed pipe systems up to 3600mm in diameter for numerous application fields (e.g. potable water, sewage, drainage, irrigation, hydro-power, industries) and with outstanding properties that ensure a long and low-maintenance lifetime of over 50 years. HOBAS has been a pioneer as producer of jacking pipes since the early 1980s. With their smooth, almost non-absorbing exterior surface, tight outer-diameter tolerances and comparably light wall structure, HOBAS GRP Jacking Pipes experience the lowest necessary jacking loads in the industry, high installation rates, and are suitable for very long and also curved drives. HOBAS. Make things happen.
<p>Hydrowork GmbH Theresienstraße 39 85399 München Germany info@hydrowork.de +49 (0) 81199885766</p> <p>Primary contact Manuela Späth- Degenkolb Managing Director</p>	31	30			✓	✓	✓	✓	✓	✓	✓	Compressed air interventions work	S-788 U5 Berlin S-550, S-623/624 Guangshengang Tunnel Shenzhen CCCC -Weisan Road River-Crossing Tunnel South, North YMSK - Istanbul Strait Road Tube Crossing Project Crossrail Thames Tunnel-London Arge Tunnel Weinberg, Zürich ARGE Tunnel XFEL Werkstatt
<p>Innovative Support Systems 15 Fountain Parade Mapplewell Barnsley S. Yorks S75 6FW info@iss-eng.com 1226381155</p> <p>Primary Contact Phil Richardson Director</p>	9	9					✓	✓				Manufacturer/supplier of environmentally friendly low carbon embankment, ground, shaft, bridge, viaduct, sea defence and tunnel support systems that allow the use of recycled materials. Advice on bespoke products is also available.	Innovative Support Systems Ltd are a UK based manufacturer and supplier of environmentally friendly low carbon embankment, ground, shaft, bridge, viaduct, sea defence and tunnel support systems that allow the use of recycled materials. Advice on bespoke products is also available.
<p>Jennmar Civil 258 Kappa Drive Pittsburgh PA 15238 info@jennmar.com +14129639071</p> <p>Primary Contact Jim Bresnen General Manager Sales</p>	1500	5			✓	✓	✓	✓		✓	✓	Rock Support Bolts, Anchoring systems, Resin	JENNMAR Civil is dedicated to providing products and services to the Civil Construction and Tunneling industries. Products include various types of rock support bolts, anchoring systems and resins to support tunneling, geotechnical, foundation and earth retention projects.

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<p>Macrete Ireland 50 Creagh Road Toomebridge County Antrim Northern Ireland United Kingdom BT41 3SE info@macrete.com +44 028 796 50471</p> <p>Primary Contact Iain Hogg Sales Director</p>	115	18									✓	Precast concrete shaft & tunnel segment manufacturers	Macrete Ireland Ltd has been a leader in precast concrete structural engineering for over 35 years. Currently holding two worldwide patents for shaft and tunnel related products, the company has been a key delivery partner on the Preston 32 scheme and the recently completed Manchester Ship Canal tunnelling works.
<p>Mapei UTT Via Cafiero n.22, 20158 Milano, Italy hq.utt@utt.mapei.com +390237673591</p> <p>Primary Contact Enrico Dal Negro Director of UTT</p>	7000	35	2111	65	✓	✓	✓	✓	✓	✓	✓	Accelerators, admixtures, TBM products, injection, consolidation, rehabilitation and waterproofing.	Underground Technology Team is the division of the Mapei group specialized in innovative systems for underground construction. Due to the investments in R&D and technical know-how, Mapei created a product range dedicated to "Underground Technology Construction". UTT consists of a team of experts and specialist technicians, with a world wide experience. The target is to satisfy the entire range of technical needs and requirements of tunneling contractors, thus improving safety and reducing time, costs and environmental impact. Main REFERENCES for: Conventional excavation: Monte Ceneri Base Tunnel, Highway A1 Florence-Bologna, Valico by-pass Base tunnel. Mechanized Tunnelling: Warsaw Metro Line, Bucharest Metro Line, Doha Metro (Red Line North and Golden line). Waterproofing: London Crossrail (Farringdon, station), Terzo Valico dei Giovi - High speed railway line COCIV.
<p>Mühlhäuser Karl-H. Mühlhäuser GmbH &amp; CO. KG In den Dorfwiesen 23 64756 Michelstadt Germany info@khmte.com +49 6061 70090</p> <p>Primary contact Paul Zeder COO</p>	86	74			✓	✓	✓	✓	✓	✓	✓	Equip. for Railbound and Tyred transp., Belts, Concreting, Grouting, Injection, Switches, Steelwork	Project specific engineering of transport logistic for tunnelling including the design manufacture and sale of Equipment. Mühlhäuser is involved in the most big tunnel Projects like: - Stuttgart 21 Germany - Kolkata und Chennai Metro - Crossrail London - Riyadh and Doha Metro - Middle River China - Toronto Metro and many others more
 <p>Natural Cement Distribution LTD 15 FOUNTAIN Parade, Mapplewell, Barnsley, S. Yorks S75 6FW sales@naturalcement.co.uk 01226 381133</p> <p>Primary Contact Phil Richardson Director</p>	7	7						✓	✓			Fast setting high strength shotcretes specialist grouts and concretes reg.31 approved products	Shotcrete for repairs to railway tunnels. Supply of specialist grouts, concretes and shotcretes to Crossrail. Special products for placement of concrete under water

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 <p><b>NAYLOR</b> AMCO PLASTICS Specialist Extrusion Products</p> <p>Naylor Amco Plastics Barnsley Road Wath Upon Dearne Rotherham South Yorkshire S63 6DQ amcoplastics@naylor.co.uk +44 1709 872574</p> <p>Primary Contact John Grice Managing Director</p>	350	40	78	6	✓	✓	✓	✓	✓	✓	✓	Ventilation Ducting Manufacturer	Naylor Amco Plastics manufactures flexible ventilation ducting and provides ventilation solutions in the mining, tunnelling, rail and water industries worldwide.
<p>Odenwald-Chemie GmbH Odenwald-Chemie GmbH Ziegelhäuser Str. 25 D- 69250 Schönau</p> <p>Germany dichtungstechnik@odenwald-chemie.de +49 6228 88 0</p> <p>Primary contact Andreas Drumm Head of sales "Seal Technology"</p>	380	5			✓	✓	✓	✓	✓	✓	✓	Acoustic materials, sealing materials,	<p>ODENWALD is a supplier of foam and fleece systems of the O.C. brand for the most diverse applications and a long-standing partner for its customers.</p> <p>Our products are used for the sealing against water, air and dust. They are applied for thermal insulation as well as for acoustical absorption and for insulation in general.</p>
<p>Palmieri S.P.A. Via Industria 58 40041 Gaggio Montano (BO) ITALY info@palmierigroup.com +39 0534 32511</p>	200	0			✓	✓	✓	✓	✓	✓	✓	Rolled Cutters & Teeth for TBMS, TBM system, Microtunnelling, Drilling Spare Parts	<p>Founded almost 40 years ago in Italy, Palmieri has grown to become a truly international supplier of highly specialized and tailor-made products and solutions for civil engineering companies through a global network. Design, engineering, manufacturing, refurbishment and rental of mechanized tunnelling and drilling equipments as TBM, Raise Boring Machines, Micro/Mini Tunnelling Machines, tailor made cutterheads for TBM, RBM, MTM, Back-up systems, muck cars, mixer, agitators, manriding cars and related accessories.</p> <p>The newest development is the production of an innovative moving system based on air cushion technology. Our contractor used the system that we designed and built for a time record shifting phase of "Martina", the biggest TBM in the world. For more visit <a href="http://www.palmierigroup.com">www.palmierigroup.com</a></p>
<p>PBE Unit 2 Parkway Denton Manchester M34 3SG United Kingdom sales.europe@pbegrp.com +44 161 337 4450</p> <p>Primary contact Jason Stout Vice President of Sales - EMEA</p>	200	35			✓	✓	✓	✓	✓	✓	✓	Control & Monitoring Systems, Voice & Data Communications, Environmental Monitoring	<p>PBE Tunnelling Solutions is the complete solutions provider for tunnel communications and control and monitoring systems. Our focus is on safety and increasing productivity in a tunnel environment. PBE provides the initial consultancy, design, support and maintenance for temporary systems used during the construction phase, through to installation of permanent infrastructure or the refurbishment of a tunnel. With extensive experience in the Road, Rail, Electricity and Water industries, PBE has the expertise to design, manufacture and install all types of underground voice communication systems, data networks, safety, control and productivity applications.</p>

Company and contact information	Number of employees		Annual turnover USD (M)	Tunnel turnover USD (M)	Regions company works in							Specialist areas	Company profile
	Total	In tunnelling			Africa	Asia	Australasia	Europe	Middle East	North America	South America		
<p>PollrichDLK Fan Factories Ziegeleistr. 18 D-74214 Schoental info@pollrichdlk.com +49 7943 91020</p> <p>Primary Contact Stephan Huesing Manager Business Unit Tunnel</p>	160	4	20	3		✓		✓	✓	✓	✓	Fans, Ventilation systems	<p>Reliable operation will be achieved with a high product quality and with a product range for a wide band of different requirements. The core range consists in the basic line of jet fans being made in appropriate material according to the application and its specific requirements.</p> <p>Portfolio: - Axial intake fans from DN 250 - Reversible tunnel jet fans up to DN 1600 - Underground fans for intake and exhaust up to DN 2500 - Command, control and monitoring including the necessary measuring equipment</p> <p>Example: Metro Warsaw Calculation of pressure losses by CFD simulation. Design of the fans and supply of the measuring equipment. Realisation: Supply of 34 smoke extract fans of the Terrajet line with diameters of 1600/1800/2000, temperature class F400</p>
 <p>Protan AS Baches Vei 1 3413 Lier Norway pal.fossum@protan.no +4732221680</p> <p>Primary Contact Paul Fossum Sales Director</p>	700	15			✓	✓	✓	✓	✓	✓	✓	Flexible ventilation ducting. Fits all TBM cassettes	<p>With pride, deliver innovative roofs, membranes, ventilation systems and technical textiles which ensure our customer's value.</p> <p>Recent projects: Brisbane Legacy Way, Alaska Highway, Alto Maipo, Ryfast, Brenner, Lian Tang, Tuen Mun.</p>
 <p>Schröder rue de Lusambo, 67 1190 Brussels Belgium info@schreder.com + 32 2 332 01 06</p> <p>Primary Contact LAMBERT Jean-Luc Market Segment Manager</p>	2600	100			✓	✓	✓	✓	✓	✓	✓	Lighting, Control Systems	<p>Schröder is your partner for tunnel lighting solutions, with more than 600,000 tunnel lighting fittings installed worldwide, including -</p>
<p>Securiton AG Securiton AG Alarm and Security Systems Alpenstrasse 20 3052 Zollikofen Switzerland info@securiton.com +41 31 910 11 22</p> <p>Primary Contact Adrian Liechti Head of Sales EMEA</p>	700	40	160	5	✓	✓	✓	✓	✓		✓	Fire detection, special fire detection	<p>Securiton continually invests in research and development in order to offer best value technologies for a safer world. For the detection of smoke, heat or flames, a variety of detection technologies have been developed to ensure efficient alarm release in dangerous situations. Combined with the most advanced fire alarm system software, the functionality of Securiton fire alarm systems know no limits when challenged by customer requirements.</p>

Company and contact information	Number of employees		Annual turnover	Tunnel turnover	Regions company works in						Specialist areas	Company profile
	Total	In tunnelling	USD (M)	USD (M)	Africa	Asia	Australasia	Europe	Middle East	North America		
<p>Shay Murtagh Precast Ltd Raharney Mullingar Co. Westmeath Ireland N91 WY91</p> <p>sales@shaymurtagh.ie 00353 44 9374108</p> <p>Primary Contact Donal McGovern Tunnel Manager</p>	250	40						✓				<p>Segment Casting, Precast Concrete Solutions,</p> <p>With continuous investment into the most modern manufacturing systems we ensure that tunnel segments are produced to the highest standards, which is reinforced with our strict quality control procedures adapted by Shay Murtagh Precast in our Integrated Management System. With our own logistics and transport teams we provide our clients with the product and service required to complete tunnel projects.</p> <p>Recently completed tunnel projects include the Corrib Tunnel in Ireland for Bam Wayss&amp; Freytag and the C310 Crossrail Tunnel under the Thames in London for Hochtief Murphy.</p>
<p>Stirling Lloyd Union Bank King Street Knutsford Cheshire WA16 6EF UK info@stirlinglloyd.com +44 1565 633111</p> <p>Primary Contact Mike Harper Development Director</p>	90	75	18		✓	✓	✓	✓	✓	✓	✓	<p>Waterproofing, Bored Tunnels, Cut and Cover Tunnels, Immersed Tube Tunnels, Suspended Decks.</p> <p>Since the 1980's Stirling Lloyd has been protecting the world's principal infrastructure assets using unique seamless waterproofing techniques. These techniques, based on our advanced sprayed resin technologies, include systems that provide new levels of waterproofing protection for tunnels helping to create dry tunnels. These systems are backed up by expert advice and technical support that enables the delivery of long-term solutions that will not let you down.</p>
<p>Tradecc Terbekehofdreef 50-52 B - 2610 Wilrijk Belgium info@tradecc.com +3238289495</p> <p>Primary Contact Elise Corens export manager</p>	80	0	3	1	✓	✓	✓	✓	✓	✓	✓	<p>Waterproofing materials (injection resins), structural reinforcement materials,</p> <p>TRADECC is one of the leading international manufacturers of construction chemicals for the industrial, civil engineering and the environmental scene. As a contractor and through its partners, TRADECC is worldwide involved in major leak sealing projects like tunnels, subways and parking. TRADECC offers a wide range of resin based materials for water sealing, temporary soil conditioning and permanent soil stabilization. Other materials that we manufacture by TRADECC and which were used in numerous infrastructure projects are its CFRP (patented) systems for the exterior reinforcements of structures and its innovative waterproofing polyurea coating.</p>

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	Total	In tunnelling	USD (M)	USD (M)	Africa	Asia	Australasia	Europe	Middle East	North America		
<p>Transforge (UK) Kestrel Way Eagle Business Park Yaxley Peterborough PE7 3GQ simon.haynes@transforge.co.uk +441733249260</p> <p>Primary Contact Simon Haynes Sales Director</p>	24	24	5	3				✓				<p>Supplier of all types of fabricated steelwork on projects such as</p> <p>Crossrail Copenhagen Metro Channel Tunnel Rail Link Toronto Metro</p>
 <p>Tunnelling Accessories Sidney Little Road Churchfields Industrial Estate St Leonards-on-Sea East Sussex TN38 9PU info@tunnellingaccessories.co.uk +44 1424 854112</p> <p>Primary Contact Philip Benford Managing Director</p>	12	12	1.2	1.2	✓	✓	✓	✓	✓	✓	✓	<p>Segmental tunnel Fittings and Packers</p> <p>Agents for Datwyler, Protan,</p> <p>We are manufacturers, distributors and Agents for a variety of different products used in the construction of tunnels. We operate all over the world through agents and have supplied the following projects:- Crossrail, Thames Tideway, Seattle, Singapore Metro, Grosvenor Mine Project, Brisbane, Panamar, City West Cable Tunnel Sydney, Central subway Tunnelling Project - San Francisco, Port Mann Tunnel</p>
<p>United Fans Middle East DMCC Mazaya Business Avenue Plot No:JLTE-PH2-BB2, Unit:203 P.O.Box : 634277 JLT / Dubai / United Arab Emirates</p> <p>info@united-fans.ae +97142766898</p> <p>Primary Contact Mehmet Okan Altan General Manager</p>	250	5			✓	✓	✓	✓	✓	✓	✓	<p>Tunnel ventilation systems / fans</p> <p>Reliability of the planning is the customer's requirement. For this reason close cooperation between consultant, principal, operator and the own R&amp;D department, based on a precise system analysis is essential. Modern methods as CFD simulation and FEM calculations, as well as standard laboratories for aerodynamic and acoustical measurements will help to achieve an optimal integration of the installation components.</p> <p>Portfolio:</p> <ul style="list-style-type: none"> <li>- Axial intake fans from DN 250</li> <li>- Reversible tunnel jet fans up to DN 1600</li> <li>- Underground fans for intake and exhaust up to DN 2500</li> <li>- Command, control and monitoring including the necessary measuring equipment</li> </ul> <p>Fans with DIBt-certificate and CE-conformity declaration are available.</p> <p>Ref : Metro Warsaw - Warsaw / Poland King Khalid International Airport - Riyadh / KSA New King Abdulaziz International Airport - JED-DAH / KSA Al Salam Tunnel - Abu Dhabi / UAE</p>

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# CONSULTANTS




The alphabetical list of consultants in the tunnelling industry, as collected by the *Tunnels and Tunnelling* survey


Company and contact information	Number of employees		Annual turnover USD (M)	Tunnel turnover USD (M)	Regions company works in							Specialist areas	Company profile
	Total	In tunnelling			Africa	Asia	Australasia	Europe	Middle East	North America	South America		
<b>AECOM</b> AECOM Los Angeles, CA (Worldwide HQ) 1999 Avenue of the Stars Suite 2600 Los Angeles, CA 90067 United States alan.boden@aecom.com +1 213 593 8100  Primary Contact Alan Boden Executive Director		2600	19000	310	✓	✓	✓	✓	✓	✓	✓	Planning, design, construction services, transport, utilities, large TBMs, IMT D&B, to trenchless	A fully integrated professional and technical services firm positioned to design, build, finance and operate infrastructure assets for public and private-sector clients globally. A leader in all of the key markets that it serves, including transportation, facilities, environmental, energy, oil and gas, water. Recent projects include Second Avenue Subway NY, Crossrail, Sydney Rapid Transport, Tagharist Dam Algeria, Montreal Line 5 Métro extension, 75% of all tunnels constructed in Hong Kong, Doha Deep Sewers, Central Interceptor Project Auckland, Downtown Line Singapore, Lima Metro Peru, Orense Bypass Tunnel Spain.
Advanced Marine 1 Gul Street 4 Jurong Singapore 629233 Republic of Singapore admar@advanced-marine.com.sg +65 6265 8122  Primary Contact Jeff Bradford Managing Director	52	12	12	2	✓	✓	✓	✓	✓	✓	Medical Lock design/ manufacture/ servicing/ sale/rental/ operators, Compressed Air training & audits	Established in 1979 and celebrating over 35 years of service, Advanced Marine is South East Asia's leading supplier of all types of Commercial Diving, Survey, ROV and Subsea Equipment. We design and manufacture a diverse range of equipment including Decompression and Hyperbaric Chambers, L.P. and H.P. Divers Air Compressor, Gas and Depth Control Panel, Helium Gas Recovery System, Environmental Control Unit, Viewports and Custom built requirements. We have designed and produced up to 1,454 products as of 2015 including Medical / Man locks for 15 projects in Singapore. Our Survey section includes ROV's and ancillary equipment, Underwater Modems and Tracking Systems, Cables, Connectors and Sliprings. Our Slogan is "The Total Service Company", providing Consultation, PVHO and Dive System Engineering, AutoCAD/3D Drawings, Solid Works Stress Analysis, Sales, Rental and Back-up Service.	
Alan Auld Group Ltd 1 South Parade Doncaster South Yorkshire DN1 2DY UK mail@alanauld.com +44 1302 329911  Primary Contact Haydn Kissack Director of International Mining	110	60			✓	✓	✓	✓	✓	✓	Design/ engineering for tunnels, Temp works design, Ground freeze design, Soft ground tunnelling	Alan Auld is prominent in the field of underground structure design including temporary works and provides site supervision and construction management services. Our expertise includes underground access design and ground control techniques, including grouting and ground freezing.	
Anagnosti IMK Bulevar Kralja Aleksandra 73/1, 11000 Belgrade, Serbia Petar [petan@beotel.net] 381 - 63 202 745  Primary Contact Dr. Prof. Peter Anagnosti President	1	1	1	1				✓			TBM operation and drill and blast	-Transportation tunnels -Hydro power tunnels -Consultancy in underground structures, geotechnical studies  -Number of tunnels in the highway Belgrade - Dimitrovgrad ( Bulgaria), --Railway ( TGV) project Belgrade -Budapest	


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 <b>ArcelorMittal</b> ArcelorMittal Bissen Route de Finsterthal L-7703 Bissen G.D. of Luxembourg s.mathieu@arcelor-mittal.com +352 621234062  Primary Contact Stephane MATHIEU Senior Technical Officer Underground Solutions	400	80			✓	✓	✓	✓	✓	✓	Steel fibres for concrete, shotcrete, reinforcement for tunnel lining segments, precast elements..	ArcelorMittal is one of the leading steel fibres suppliers providing safe, sustainable and cost effective constructive solutions for industrial, residential and civil construction markets. Our technical and sales teams offer comprehensive services throughout the world with customized support to all involved in the design, specification and installation of steel fibre reinforced concrete. Today we are present in more than 25 countries providing the latest technology on steel fibre reinforced concrete projects.	
<b>ARUP</b> Arup 13 Fitzroy Street London W1T 4BQ United Kingdom tunnel-design@arup.com +1 212 896 3000  Primary Contact Jon Hurt Principal / Global Skills Network Leader	200		1900	60	✓	✓	✓	✓	✓	✓	Primary/ final support/ liner design, Ground investigations, MEP/FLS, Lenders advice, Expert witness	Arup is one of the world's largest independent engineering firms and a trusted industry leader in the planning, design and delivery of underground projects of all types and sizes. Arup's approach to tunnel projects embraces all that is best in truly multidisciplinary and joined-up design. Arup's total design approach, using committed specialists working closely together, has produced exciting and innovative solutions to some of the world's most complex and challenging tunnel projects. Our services cover all types of underground projects including rail, water, CSO, utilities, mine development and transportation. Arup's current underground projects include Crossrail (UK), Lake Mead Intake No. 3 (USA), Tuen Mun - Chek Lap Kok Link (Hong Kong), Crenshaw Light Rail (USA), Copenhagen Metro, Fehmarnbelt, Thomson Line (Singapore), 2nd Ave Subway (USA), Sydney Opera House VAPS, York Potash (UK).	
Babendererde Engineers Babendererde Engineers Markt 2 23611 Bad Schwartau contact@babeng.com +494513009390  Primary Contact Lars Babendererde Principal	15	15			✓	✓	✓	✓	✓	✓	Design, construction management, consulting, special app., troubleshooting, insurance cases, optimization	Babendererde Engineers is a worldwide engineering and consulting company specializing in underground works. We support projects involving tunnel boring machines (TBMs), whether for highly mobile pipe jacking projects or for large diameter traffic tunnels in challenging geological conditions, during all phases - from feasibility study to design and from construction to contract closure. Babendererde Engineers supports all parties involved with its technological know-how and vast industry experience. Another specialty of ours is facilitating TBMs in difficult situations. Working together with the contractor and using our extensive knowledge, regarding, for example, passing faults with conventional by-passes or the optimization of work processes, Babendererde Engineers puts TBMs back on track.	


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 <p><b>Bekaert Maccaferri Underground Solutions</b> SkylinE 40 Korte Keppestraat 21/02 9320 Erembodegem - Aalst Belgium contact@bm-underground.com +32 53 43 10 10</p> <p>Primary Contact Sofie Wijmeersch Marketing Communications Officer</p>	45	45			✓	✓	✓	✓	✓	✓	<p>Fibres and Chemicals for Shotcrete, Precast Segment Accessories, Tubular Steel Arch Support System</p> <p>Bekaert Maccaferri Underground Solutions, your global partner for smart reinforcement of your tunnelling and mining project. At Bekaert Maccaferri Underground Solutions, we have a team of technical experts available, especially dedicated to the underground construction world. Our high quality product portfolio is unique and sets a new standard. Bekaert Maccaferri Underground Solutions offers you a full service: technical guidance, project feasibility, reliable delivery, on-site assistance, customized equipment and consistent flow of high-quality products. We optimize your project, by providing innovative, more cost-effective and safer solutions. Via an increased local presence and global production capacity, our highly skilled technical team can respond quickly to your needs and requirements. Bekaert Maccaferri Underground Solutions understands you. Because we are tunnelling.</p>	
<p>Boro Lukajic and Associates Inc. 2593 Vineland Rd Mississauga, Ontario, Canada L5K 2A3 tac@interlog.com 416 895 0284</p> <p>Primary Contact Boro Lukajic President</p>	1	1	1	1						✓	<p>Drill and Blast and TBM excavation</p> <p>Provided specialised consulting to Owners on tunnelling and hydro power. Recent projects: -Yukon Territory Mayo B tunnel -Mill Creek Tunnel, Cleveland Ohio -Pointe du Bois spillway, Manitoba -Tazi Twe hydro project, Northern Saskatchewan</p>	
<p>Canary Systems Canary Systems, Inc. 5 Gould Rd New London, NH 03257 info@canarysystems.com +1 603 526 9800</p> <p>Primary Contact Alex Neuwirt CEO</p>	25	2			✓	✓	✓	✓	✓	✓	<p>geo-monitoring, data acquisition systems, instrumentation</p> <p>We provide cost-effective, reliable, state-of-the-art data collection and information systems to a broad market range, including tunneling, civil engineering, geotechnical engineering, mining, environmental, meteorological, and many more. This includes instrumentation selection, system architecture, hardware and software development, database development and web online data access systems.</p>	
 <p><b>CH2M</b> Elms House 43 Brook Green Hammersmith London W6 7EF Martin.Knights@ch2m.com +44 20 3479 8000</p> <p>Primary Contact Martin Knights Global Head of Tunnelling and Earth Engineering</p>		550			✓	✓	✓	✓	✓	✓	<p>Tunnel, shaft and cavern design, GI, construction and programme management, seismic engineering</p> <p>Employee-owned CH2M is one of the worlds leading consulting, design, design-build and programme management companies serving government, civil, industrial and energy clients. We employ over 25,000 employees globally of which 3,400 are based in the UK. Our work is focused in the areas of water, transportation, environment, energy, facilities and resources. With our combined engineering and management skills we; plan, design, and manage programmes of tunnel related work and advise on operations and maintenance for metros, highways, water/sewerage, hydro, utilities and storage tunnels. We are working on some of the most iconic and challenging infrastructure programmes across the globe including; High Speed 2, Crossrail 2 and Thames Tideway Tunnels in the UK; Blue Plains Tunnel in Washington DC; STEP sewerage programme in Abu Dhabi and Kishanganga Hydro-electric Project in the Himalayas.</p>	

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<p>Compco Fire Systems Cleeve House, Malvern Road, Worcester, WR2 4YX enquiries@compco-fire.co.uk 01905 741600</p> <p>Primary Contact John Sinclair Managing Director</p>	415	100	33	1						✓	<p>Design, supply, installation and maintenance of Automatic Fire Sprinkler systems.</p> <p>For over 27 years, COMPCO has been at the forefront of protecting people and property from fire. As the UK's largest independently owned fire-engineering company, COMPCO has the expertise, resources and stability to meet the needs of clients and projects of any scale. From a project-managed installation to servicing and maintenance, we will tailor our services to the exact requirements of your project. With a broad experience in all fire-protection technologies, we will make sure you benefit from the most suitable solution for your needs. We have a long list of clients that have selected us to protect them from fire. These include landmark locations such as the British Museum, Royal Ascot and the Millennium Stadium, and blue chip companies such as IBM, IKEA, Honda and Rolls Royce.</p>	
<p>Devico AS Postbox 206 Drammensvegen 55 N-7224 Melhus Norway devico@devico.no +47 72 87 01 01</p> <p>Primary Contact Ben L'Heureux BDM - Marketing Manager</p>	45	20			✓	✓	✓	✓	✓	✓	<p>Directional Core Drilling, Pilot hole Directional Core Drilling,</p> <p>When planning the construction of tunnels, rock caverns and shafts, an extensive investigation of the rock formation in the area is required. The investigation is used to identify problematic ground and secure an efficient and low-risk construction.</p> <p>Directional core drilling is an investigation method that allows core sampling along any defined trajectory, providing extremely accurate and relevant information about the rock formation near the planned underground construction.</p> <p>What directional core drilling can provide: Continuous core sample and geological information from the planned tunnel trajectory Data on the extent and orientation of problematic rock formations Information about the mechanical properties of the rock formations</p>	
<p>Donaldson Associates Donaldson Associates Ltd. Eastfield Church Street Uttoxeter Staffordshire ST14 8AA utttoxeter@donaldsonassociates.com 01889 563680</p> <p>Primary Contact Damian McGirr Tunnelling Director</p>	140	86	12		✓	✓	✓	✓	✓	✓	<p>Feasibility to detailed design of all tunnel types. Expert in SCL. Innovative remedial works design</p> <p>A wealth of experience in tunnelling and the use of underground space. Design of tunnels from small dia. augerbores/pipejacks to large dia. TBM or drill &amp; blast tunnels. Design of timber headings, cut &amp; cover tunnels, SCL and shafts. Our staff have been involved in the design of tunnels for rail, road and utilities in the UK and overseas. 1. Crossrail C300-C410: London. Contracted to design and manage the SCL. Scope also included review, excavation stability and mining settlement. The team designed toolbox items and temporary works for 72 SCL tunnels, including at Bond Street and TCR stations, cross-overs and cross passages. Also part of the SCL onsite management team with direct supervision of all tunnel construction. 2. Borders Rail, Scotland. Detailed design and site supervision for existing and new earthworks (100km), remedial works to existing tunnels and permanent access points.</p>	

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 Dr. Sauer & Partners 11 Langley Avenue, Surbiton, Surrey, KT6 6QH london@dr-sauer.com +44 208 339 7090  Primary Contact Gerald M. Skalla MD	75	70			✓	✓	✓	✓	✓	✓	Tunnel Geotec Construction Mgt Monitoring Waterproofing Rehabilitation Supervision Mining Supt	Dr. Sauer & Partners is a leader in tunnel engineering, offering design and consulting services for tunnel projects around the globe. The firm specialises in the design and construction supervision of NATM/SEM/SCL tunnels. Since 1980 Dr. Sauer & Partners has designed and constructed more than one hundred tunnel projects including transit, rail, highway and water tunnels globally. Dr. Sauer & Partners designs tunnels for urban and rural areas and in any type of geology, including soft ground, mixed-face conditions and hard rock.  Some of the current projects Dr. Sauer & Partners is working on include; Chinatown Station, San Francisco, CA Ottawa Light Rail, Ottawa, ON, Bank Station and Bond Street Station Upgrade, London, Crossrail London, Red Line, Tel Aviv, Israel Eglinton Crosstown LRT, Toronto, Canada	
E-Berk Tunnel Et Foundation Technologies Anadolu Organize Sanayi Bolgesi 29 Ekim Cd. No:3 Temelli / ANKARA e-berk@e-berk.com +903122674848	160	95	10	8		✓		✓	✓		TBM Operation, TBM Manufacturing, TBM Overhauling	E-Berk Machine and Metallurgy has been serving to Turkish Metal Industry since 1993, moreover E-Berk Machine and Metallurgy's activities have been continuing with providing Tunnel Boring Machines' spare parts and cutter head revisions since 2002.	
 Gall Zeidler Consultants 44345 Premier Plaza, Suite 210 Ashburn, VA 20147 office@gzconsultants.com +1-703-726-2700  Primary Contact Vojtech Gall Principal	53	45	12	12	✓	✓	✓	✓	✓	✓	Construction Management, Tunnel Design, Geotechnics, Engineering	Project Name: Crossrail; Project Client: Mott MacDonald; Project Location: London, UK; Tunnel Length (km); 20; Tunnel Diameter (in metres): 50-200; Construction Method: SCL, NATM; Role: Design Support Services; Contract Value: (USD in millions): 3.6  Project Name: East Side Access Tunnel; Project Client: Parsons Brinckerhoff / STV JV; Project Location: New York, New York; Tunnel Length (km): 7; Tunnel Diameter (in metres): 33; Construction Method: Hard Rock TBMs; Role: Design, structural and geotechnical instrumentation and monitoring programs, construction and waterproofing and final lining; Contract Value: (USD in millions): 3	
 Gall Zeidler Consultants - UK AMP House, 4th Floor, Suite 20 Dingwall Road Croydon Surrey CRO 2LX office@gzconsultants.com +44-(0)20-8686-6887  Primary Contact Kurt Zeidler Principal	53	45	12	12	✓	✓	✓	✓	✓	✓	Construction Management, Tunnel Design, Geotechnics, Engineering	Project Name: Crossrail; Project Client: Mott MacDonald; Project Location: London, UK; Tunnel Length (km); 20; Tunnel Diameter (in metres): 50-200; Construction Method: SCL, NATM; Role: Design Support Services; Contract Value: (USD in millions): 3.6  Project Name: East Side Access Tunnel; Project Client: Parsons Brinckerhoff / STV JV; Project Location: New York, New York; Tunnel Length (km): 7; Tunnel Diameter (in metres): 33; Construction Method: Hard Rock TBMs; Role: Design, structural and geotechnical instrumentation and monitoring programs, construction and waterproofing and final lining; Contract Value: (USD in millions): 3	


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Geo-Design Consulting Engineers Ibsley House Mockbeggar Lane Ringwood Hampshire BH243PR info@geo-design.co.uk +44(0)1425473005  Primary Contact Robert MacKean Director	11	10			✓	✓	✓	✓	✓	✓	Geology and hydrogeology, rock tunnel and cavern engineering, numerical analysis, expert witnesses	The Geo-Design Group is a specialised international consultancy with a central focus on Geology and Rock Engineering both for surface and underground structures principally in the fields of Cavern Engineering, Rock Tunnelling and Slope Stability. Specialist services are currently being provided to the following projects: Express Rail Link, Hong Kong, Contracts C822 and C823 Ulu Jelai Hydropower Scheme, Malaysia HS2 York Potash - Mineral Transfer Tunnel Cross Israel Highway	
Geoconsult Hoelzlstr.5 5071 Wals near Salzburg Austria office@geoconsult.eu +43-662-65965-0  Primary Contact Dr. Harald Golser CEO	315	268	28	23	✓	✓	✓	✓	✓	✓	Design for tunnels, Geology, Geotechnical services, Project/construction management	Geoconsult is an independent engineering Et consultancy group serving private enterprises and governments around the world. Since 1973, Geoconsult has grown into a company with more than 350 employees and offices in Argentina, Austria, Chile, Germany, India, Singapore, Slovak Republic and Turkey. Geoconsult's leading role as engineering company in the tunnel consulting field is best demonstrated by some actual examples: - JV leader of the Pir Panjal Railway Tunnel Project (longest railway tunnel in India with a length of approx. 11 km) - JV leader for the Koralmtunnel (railway tunnel in Austria with a length of approx. 32 km) - Consultancy for the metro systems in: Delhi, Budapest, Dubai, Perth, Bangkok, Hong Kong, Singapore, Santiago/Chile, Buenos Aires.	
 GEOCONTROL Cristóbal Bordiú, No. 19-21, 5º, 28003 Madrid   España geocontrol@geocontrol.es 34915531763  Primary Contact Benjamin Celada Tamames President and General Manager   Professor Et Ph.D. (Eng.)	67	59	7.4	7.4			✓			✓	Underground Works:	Geocontrol is an independent engineering company established in 1982 specialised in the Design and Geotechnical Applications of Underground Works. It has participated in more than 342 tunnels (1.000 Km). The company has offices in Brazil, Chile, Colombia, España and Peru. Detailed Engineering Et Site Supervision LINE 6, Santiago Subway (Chile); 16,5 Km, 10 Stations, 11 Shafts; NATM; Client: Metro de Santiago * Basic Engineering LINE 4, Lima (Peru); 28 Km, 22 Stations, 22 Shafts; NATM; Client: Proinversion * Detailed Engineering LINE 2, Lima Subway (Peru); 8 Km; NATM; Client: Consorcio Constructor M2 Lima * Feasibility Study of Santiago-Valparaíso Railway Corridor (Chile); 110 Km, 40 Km of tunnels; Client: GRUPO EFE * Basic and Detailed Engineering LINE 6, Sao Paulo Subway (Brasil); 5,3 Km, 5 Stations, 5 Shafts; TBM, EPB, NATM; Client: Consorcio Expreso L6.	
GHD Melbourne 180 Lonsdale Street Melbourne, VIC 3000 steve.macklin@ghd.com 03 86878663  Primary Contact Steve Macklin Tunnel Service Line Leader	8500	50	1500	22	✓	✓	✓	✓	✓	✓	Bored, mined Et cut and cover tunnels; shafts Et caverns; ventilation Et vibration; fire Et life safety	GHD is one of the world's leading engineering, architecture and environmental consulting companies. GHD's tunnelling team holds extensive international experience in both hard rock and soft ground tunnel and underground space design. Our tunnel engineers provide input during all stages of a tunnelling project from planning and design through to specification and on-site verification. Our experience has been enhanced through the delivery of award winning technical solutions to both Contractors and Clients.	


Company and contact information	Number of employees		Annual turnover USD (M)	Tunnel turnover USD (M)	Regions company works in							Specialist areas	Company profile
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GKM Consultants INC 1430 Hocquart Suite 100 St-Bruno, QC J3V 6E1 info@gkmconsultants.com 450-441-5444  Primary Contact Stéphane-Eric Thivierge Président	14	5	5	3	✓	✓	✓	✓	✓	✓	✓	Dams, foundations, Deep excavation, tunneling and mining.  Products lines includes instruments utilizing vibrating wire, electrical resistance strain measurement, semiconductor, fiber optic, MEMS, noise and vibration monitors etc.  Over the years, we have developed unique systems monitoring know-how thanks, in particular, to the manufacturing and development of acquisition software and monitoring systems that process and automatically release data.  Our services include system design, procurement supply, on-site verification and testing, installation assistance and guidance, dataloggers programming, database implementation and data hosting.	GKM Consultants is now recognized both nationally and internationally for its expertise and know-how in providing innovative and well-integrated instrumentation and monitoring solutions.
 Global Tunnelling Experts Rivium 2 Straat 41b, 2909LG Capelle aan den IJssel, The Netherlands info@global-tunnelling-experts.com +31 10 266 94 44  Primary Contact Kevin Browning, Claus Nielsen Managing Directors	227	200	19	19	✓	✓	✓	✓	✓	✓	✓	Personnel supply for all mechanized tunnelling systems, NATM, SCL, SBR, deep drilling rig	GTE provides experts with proven references for your tunnelling projects. They can cover all requirements for mechanized tunnelling work, for all types of machine, back-up logistics and maintenance. We also provide specialists for NATM, SCL, deep drilling and shaft boring roadheader. Depending on the clients requirements GTE can provide the entire construction site crew or complete a team with the right specialists, whether it is short- or long-term. Recent projects GTE was involved include: -Hallandsas/Sweden, -Liefkenshoek/ Antwerp-Belgium, -Crossrail/London-Great Britain, -Neelum Jhelum Hydropower Project / Pakistan -Doha Metro/Qatar, -Eurasiatunnel/ Istanbul-Turkey, -Waterview Connection/Auckland-New Zealand -Terra Invador/Salvador-Brazil -Jansen Mine/Saskatoon-Canada
Hatch Mott MacDonald 1400 Broadway, 30th Floor, New York, New York, 10018 colin.lawrence@hatchmott.com +1 (212) 589-1133  Primary Contact Colin Lawrence North American Tunnel Practice Leader	2800	180								✓		Planning/ Preliminary Design, Program Management, Final Design, Risk Management Et Assessment + more	Hatch Mott MacDonald is a leading North American consulting engineering firm that provides comprehensive engineering services for tunnel, mining, hydropower, highway, transit, rail, port handling, and utilities projects. Known for its award-winning, multidisciplinary expertise, our track record of major accomplishments are delivered by outstanding staff dedicated to engineering excellence. We have a talent pool of approximately 2,800 staff in 76 offices across North America. Our tunnel experience dates back to involvement in developing London's underground rail system at the turn of the last century and Toronto's subway system in the early 1950s. Since that time, we have been involved in the design, construction, and management of some of the world's most ambitious tunnel projects, including the Channel Tunnel, the Central Artery Project in Boston, and the 'Smart' Tunnel in Kuala Lumpur.



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IGT Geotechnik und Tunnelbau Mauracherstr. 9 5020 Salzburg Austria salzburg@igt-engineering.com +436626417270  Primary Contact Andreas Leitner Managing Director	95	95	12	12	✓	✓	✓	✓	✓			Tunnel design, Geotechnics, Project Management Et Supervision, Expertise, Software Development	Renowned specialist in both NATM and TBM tunnel design Et site supervision for road, rails, HSR, metro and utility tunnels. Ongoing projects include Crossrail in cooperation with Donaldson in London and design of Semmering Base Tunnel for Austrian Federal Railways in Austria (within a JV).
 Ing.-Buero Dipl.-Ing. H. Voessing GmbH Brunnenstrasse 29-31 40223 Duesseldorf Germany duesseldorf@voessing.de +49 211 90545  Primary Contact Bernd Kleine Kuhlmann Branch Manager	450	45				✓		✓	✓			Project planning, Design / engineering, Construction supervision, Consulting, Management, Freezing	Vössing's tunnelling experts are experienced in all standard tunnelling techniques, from the cut-and-cover method with and without compressed air through caisson construction, shotcrete tunnelling and shield, hardrock and pipe driving in soil with hydraulically and pneumatically supported facing to the technique of floating tunnel sections into place. One special area of Vössing expertise is soil stabilization by freezing. Only modern methods permit efficient planning on competitive terms. Our tunneling teams are always abreast of the latest technological developments and thus able to meet increasingly stringent requirements. In every case, we present the client with a tailored solution.
Inter Techno Commerce ITC SA Rue de la Fusion 122 CH - 1920 Martigny Switzerland info@itcsa.com +41 27722191  Primary Contact Carlo Bretz President	5	5									✓	Tunnel Loading and Heading Machines, Special Equipment for Tunneling and Mining, Tunnel Excavators	ITC SA is a tunnelling equipment designer and supplier. Its application areas are roadway, highway, railway and subway tunnels, and tunnels for hydroelectric schemes, tunnels for sewers as well as tunnels for mining. Starting in 1971, ITC SA has been selling mining and tunnelling equipment to construction yards all over the world. With over 500 machines operating throughout the world, the crawler excavator became a tremendous success, mainly due to an outstanding performance and an ever-evolving concept. The company's strength is the vast wealth of international experience in tailoring its product to match each customer's specific job-site requirement. Every tunnel excavation / loading and rail-track reconstruction is different and has its own specific requirements. Whether in tunnels, in mines or on rails, the ITC team is ready to meet the next challenges.

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Integral S.A. Cra. 46 N° 52-36, Piso 14. Medellin, Colombia comercial@integral.com.co (574)5115400  Primary Contact Remigio Perez Marketing and sales manager	1200	70	34									✓	Geology; Environmental studies; Hydraulic; Structures; Roads & transportation, among others.  Business lines: Electric Energy, Infrastructure, Mining and Oil & Gas AND, Water supply and sanitation.  Engineering Services: Studies and designs, Supervision of works, Project management, Consultancy.  Projects: Ituango (2.400 MW), Sogamoso (820 MW), Porce II (392 MW), Porvenir II (352 MW), Quijos in Ecuador (50 MW), Kaigah in Pakistan (540 MW), Minas San Francisco in Ecuador (276 MW) and, San José in Bolivia (118 MW) hydroelectric projects; Ruta del Sol road concession, Pasto - Rumichaca highway concession, Túnel de Occidente and Oriente road tunnels in Antioquia, Several tunnels for hydroelectric projects such as Ituango (17 km), San Carlos (13 km), Jaguas (3.7 km), Riogrande II (26 km), among others; Bogotá Metro (1st line), Medellín Metropolitan Train, Extension of Line A of the Metro in the South of the Aburrá Valley, among others.
Jacobs Jacobs 1180 Eskdale Road Winnersh Wokingham Berkshire RG41 5TU UK Peter.Gilbert2@jacobs.com +44 121 237 4000  Primary Contact Peter Gilbert Head of Ground Engineering	0		12700		✓	✓	✓	✓	✓	✓	✓		Design of bored tunnels, cut and cover tunnels, shafts, pipejacking and micro-tunnelling  Jacobs is one of the world's largest and most diverse providers of technical, professional, and construction services. We provide our clients with a wealth of tunnelling experience from around the globe. Our expertise covers the full spectrum of project services including planning, preliminary engineering, final design, and construction management. We have a proven track record of successfully delivering major underground projects to clients across a range of sectors including: water supply and wastewater, transit, highways, and energy. We have experience under a full range of geologic conditions and using all types of underground construction methods including: Tunnel Boring Machines, shield tunnelling, roadheader excavations, sequential excavation techniques, drill-and-blast tunnelling, immersed tube methods, and cut-and-cover construction.
Lachel Et Associates PO Box 1059 Morristown, NJ 07962 marketing@lachel.com 973-734-0200  Primary Contact David Chapman President	19	19	5	5								✓	Tunnel Design, Construction Engineering, Risk Management, Constructability & Cost Estimating  Lachel Et Associates (Lachel), a Schnabel Engineering company, specializes in design and construction management services for tunneling and other heavy civil construction projects in the areas of transportation, water and wastewater infrastructure, and hydroelectric power. Our goal is to meet the needs of clients by providing fully integrated management and technical services that are objective, thorough, and effective.  Our staff provides a diversified blend of skills under one corporate roof. We combine our expertise in the design and construction of underground structures with a keen understanding of nuances and interrelationship of geology, hydrogeology, and geotechnics on underground projects.

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Lar Consulting Engineers Co. 30 Sharifi Street, Gandhi Street, Vanak Sq. Tehran, 1969944311, Iran mine.eng101@gmail.com (0098)21-8888-3905  Primary Contact Ghassem Jalilian Khav Chief Design Engineer and Project Manager	520	85										✓	Assessing geological hazards, ground control and improvement systems.  In every working environment has demonstrated leadership in directing cross-functional teams to the highest levels of performance. Company team strengths are highlighted by determination, supportive cross-functional leadership and analytical problem solving. Offer proven technical management and leadership skills, with the added capability of being able to recruit, persuasively communicate and effectively motivate.
London Bridge Associates Cranhurst Lodge, 37-39 Surbiton Hill Road, Surbiton, KT6 4TS www.lbassoc.co.uk +44 (0)208 3998614  Primary Contact Mr David Sharrocks Managing Director	40	35	8	7		✓	✓	✓					Tunnelling Management, Construction Planning, Cost Planning, Risk Management, Monitoring, BIM, Tunnel Data (TIM)  LBA provides tunnel management support to Clients, Consultants, Contractors and others by using a combination of staff with established reputations as experts in their fields and good younger staff who are making their way in the industry in a way that generates real value for our clients at all stages in the construction cycle. Recent and current projects include London Power Tunnels where we provided front line staff; Bond Street Station Upgrade where our team provides survey, tunnelling, assurance, engineering and interface management support; HS2 where we are providing construction planning to the design team and value management and project planning support to the Client; Tideway where we are an integral part of the Clients project management team and many others. In addition to our mainstream activities we provide Fire Engineering and Fire Safety support, CDM support, and we have a Tunnel Information Management system (TIM) that is now in use on the first two projects listed above.
Mosen Ltd Unit 15 Riverview Business Park Station Road Forest Row East Sussex RH18 5FS United Kingdom info@mosenltd.com +441342458427  Primary Contact Dr Fathi Tarada Managing Director	8	8	0.5	0.5	✓	✓	✓	✓	✓	✓	✓		Tunnel ventilation, fire safety engineering, tunnel safety and Computational Fluid Dynamics.  Mosen Ltd is a leading engineering consultancy. We were established in 2007 to address the needs of a range of clients including developers, designers, architects and contractors for bespoke advice on fire safety engineering, risk management, tunnel ventilation and Computational Fluid Dynamics. Our leading edge technology is underscored by our patents and patent applications in the field of tunnel ventilation, and our wide range of technical publications.  Mosen Ltd has provided professional services for major infrastructure projects including Conwy Tunnel, Athens Metro, Tehran Metro, Crossrail West, Singapore Metro and HS2. Please have a look at our website www.mosenltd.com for more details of our capabilities and experience.

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<p>Mott MacDonald Mott MacDonald House 8-10 Sydenham Road Croydon Surrey CR0 2EE United Kingdom marketing@mott-mac.com +44 208 7742000</p> <p>Primary Contact Mr Mike Savill Manager Tunnels</p>		500	2200	200	✓	✓	✓	✓	✓	✓	✓	<p>Design/engineering for tunnels Sprayed concrete linings (SCL) TBM &amp; shield tunnelling</p> <p>Bored tunnels in hard rock or soft ground Tunnel boring machines Segmental &amp; sprayed concrete linings Drill &amp; blast Cut-and-cover Immersed tube Trenchless methods, micro-tunnelling, pipejacking and directional drilling Shaft sinking Tunnel refurbishment</p> <p>Key projects: Crossrail, HS2, Crossrail 2, Victoria Station upgrade, National Grid London Power Tunnels, Shuakevi Hydropower, Counters Creek, Lee Tunnel Shafts, Bergen Bybanen, Et A3 Hindhead.</p>	
<p>Mouchel Consulting Mouchel, 1st Floor, Exchange Station, Tithebarn Street, Liverpool, L2 2QP UK peter.bishop@mouchel.com +44 151 600 5571</p> <p>Primary Contact Peter Bishop Technical Director -Tunnels Engineering</p>	8000	145	1300	10		✓	✓	✓				<p>All M&amp;E and Life safety systems.</p> <p>Now part of the Kier group, along with Kier Strategic Highways, Mouchel Consulting is a multi-disciplinary Consultancy and service provider whose Tunnel focus centres upon M&amp;E and Tunnel fire life safety system design; cost effective routine maintenance; project management and Tunnel related staff training, enabling their wide client base to ensure their Tunnels are operated to the highest standards of safety. Mouchel also specialises in Post Incident recovery plans; SCADA and Ventilation design and reviews; General and Principal Inspections. Our Tunnels team have all managed and worked upon Road Tunnels. Recent projects include a re-design of Lighting and power supplies for the Kingsway Mersey Tunnel, a major feasibility study for a long Trans Pennine Tunnel, and upgrades to Meir and Saltash Tunnels.</p>	
 <p>NOMA Consulting Singapore 186B Telok Ayer Street Singapore 068632</p> <p>Australia Level 1, 530 Little Collins Street Melbourne VIC 3000 office@noma-consulting.com +65 62229332 / +61 (03) 9028 2900</p> <p>Primary Contact Andreas Amon Director</p>	10	10	2	2	✓	✓	✓	✓				<p>Mined and mechanised tunnels, C&amp;C tunnels and shafts, Geotechnical engineering, Construction support</p> <p>NOMA Consulting is an engineering consultancy specialised in underground construction. We approach every project with a unique focus on delivering outstanding engineering solutions and unrivalled customer service.</p> <p>Projects: - Tuen Mun Chek Lap Kok Link, Hong Kong - Thomson Line - Contract 208, Singapore - North West Rail Link Project, Sydney - Australia - Narrows Marine Crossing, Gladstone - Australia - Perth City Link, Perth - Australia - Airport Link and Northern Busway, Brisbane - Australia several other smaller and tender projects.</p>	

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<p>Parsons Corporation 100 West Walnut Avenue Pasadena, CA 91124 United States of America Steve.Minassian@parsons.com 1 (248) 513-2391</p> <p>Primary Contact Steve Minassian Sr. Vice President</p>		250	3000	100	✓	✓	✓	✓	✓	✓	✓	<p>Construction, design of underground for transportation, water, environmental, commercial, defense.</p> <p>Parsons recently completed construction management services for the Lake Mead Intake No. 3 in Nevada, design and construction services for the Austin Downtown Sewer Tunnel in Texas, construction management services for the South Cobb Sanitary Sewer Overflow Tunnel in Georgia, Caldecott 4th bore highway tunnel in California.</p>	
<p>ROCKSOIL Piazza San Marco, 1 I-20121 Milan (Italy) rocksoil@tin.it +39026554323</p> <p>Primary Contact Alberto Balestrieri Foreign Business Development Manager</p>	155	131	12.5	12	✓	✓	✓	✓	✓	✓	✓	<p>Design of tunnels (conventional and mechanized), special foundations, environmental recovery and repair, Monitoring</p> <p>Established in 1979, Rocksoil S.p.A. quickly grew into a leading company in civil engineering design for underground works, special foundations and stabilisation where excavation and landslides make stability an important design factor. Rocksoil's design and construction procedures now constitute new standards both in Italy and abroad where they are used to update norms and specifications (e.g. ADECO-RS approach).</p> <p>Copenhagen metro (Denmark), City Ringen, line tunnels (2x19000 m, EPB shield Ø 6,20 m) and stations, work in progress Ryad metro (Saudi Arabia), Package 2, undergrounds works (5000 m, Ø 9,00 m) work in progress Doha metro (Qatar), Red Line North - "AL Diwani" underground station, work in progress Rome metro, Line C, line tunnels (2x3198 m, EPB shield Ø 8,80 m) and stations, work in progress Warsaw metro (Poland), Line 2, line tunnels (2x4800 m, EPB shield Ø 6,00 m) Milan metro, Line 5, line tunnels (2x8000 m, EPB shield Ø 7,30 m) and stations Tunnels for the new A1 Bologna-Florence motorway (2x18550 m, Ø 17 m) Tunnels no. 8 and 8a in Sochi (Russia), (2x1400 m, Ø 12/17 m)</p>	
 <p>Saanio Et Riekkola Laulukuja 4 00420 HELSINKI FINLAND saanio.reikkola@sroy.fi +358 9530 6540</p> <p>Primary Contact Anssi Auvinen Head of International Operations</p>	580	75	50	8		✓	✓		✓			<p>Main Design, Cost Estimations, Rock Engineering, HVAC, GW Flow, Grouting, D&amp;B, LCA, Maintenance Plan</p> <p>Saanio Et Riekkola Oy (S&amp;R) is a multi-discipline engineering consultancy from Finland specialised in underground facility design for civil infrastructure, mining and nuclear waste management. The company provides technical expertise to challenging underground facility projects, such as road and rail traffic tunnels, underground parking lots, substations, waste water treatment plants, defense shelters and deep geological repositories. Our clients include both public and private agencies in Finland and Internationally. From preliminary cost estimations and conceptual design, to construction supervision and monitoring plans, we provide state-of-the-art design solutions worldwide.</p>	

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<p>Senceive Senceive Limited Hurlingham Studios Ranelagh Gardens London SW6 3PA jvernon@senceive.com +44 20 7731 8269</p> <p>Primary Contact Jeremy Vernon Business Development Manager</p>	13	13										<p>Wireless Remote Condition Monitoring, Tilt, Temp, Cameras, Strain Gauges, Piezometers, Load Cells</p> <p>Intelligence and decision making at node level. Trackbed, Tunnels, Retaining walls and Structures, Earthworks and Embankments</p>	<p>Senceive supply high precision tilt sensors to the rail and construction market. Utilising our wireless platform we achieve outstanding reliability, robustness and repeatability on a variety of sensors.</p> <ul style="list-style-type: none"> <li>* 15 years of battery life</li> <li>* Wire and Power Free</li> <li>* LU type approval and NR accepted</li> <li>* Precise/Stable data @ 0.053mm/m</li> <li>* Highly Cost effective and re-deployable</li> <li>* 1000's of units deployed/10 years of success</li> <li>* Simple alerts/triggers</li> <li>* Easy to use data visualisation</li> <li>+ Many other features</li> </ul>
 <p>SELI Technologies Via A. Campanile 73, 00144 Roma, Italy info@selitech.net +390687724200</p> <p>Primary Contact Andrea Imbrenda CFO</p>	26	26	20	20	✓	✓	✓	✓	✓	✓	<p>TBM design, Jobsite technical assistance, TBM overhauling, auxiliary equipment design</p>	<p>Seli Technologies Ltd, established at the end of 2013, inherits the expertise and know-how developed in more than 60 years by the Seli Spa Group in civil works design, special underground equipment design, manufacturing and overhauling (Tunnel Boring Machines, Backup, Rolling stock, etc.)</p>	
 <p>SUBTERRA Ingenieria José M Infante 2802, Ñuñoa, Santiago. Chile Vallehermoso 18, 28015 Madrid. Spain. José Pardo 601. Of. 801, Miraflores, Lima. Peru. Calle 48B. N°79-24, La Floresta, Medellín. Colombia</p> <p>info@subterra-ing.com +34 915430679 +56 229196912</p> <p>Primary Contact Jose-Miguel Galera Managing Director</p>	59	59	8	8	✓	✓	✓	✓	✓	✓	<p>Geotechnics, tunnel design, shaft, cavern, site engineering and construction supervision</p>	<p>SUBTERRA is a leading consultancy company working on mining, civil and hydroelectrical projects, with a special expertise in tunnels and all types of underground excavations. Our services cover the engineering for tunnelling design and the site engineering at the construction stage. Established in Colombia, Chile, Peru and Spain; actually it has active projects in Mexico, Guatemala, Ecuador, Peru, Brazil, Chile, Spain and Algeria. The main on-going projects are the Guadalajara Metro, PH3, Cuetzalain and Rio Frio hydroelectrical projects in Mexico, El Recreo hydroelectrical project in Guatemala, Obras de cabecera Marca 2 and Yanango tunnel in Peru, and Americo Vespucio Oriente, Alto Maipo hydroelectrical project and Kennedy tunnel in Chile.</p>	
<p>Thurber Engineering Ltd. 180, 7330 Fisher Street SE Calgary, AB T2J 6P4 hhein@thurber.ca +1 403-253-9217</p> <p>Primary Contact Dr. Heinrich Heinz Principal</p>	300	20			✓	✓	✓	✓	✓	✓	<p>Geotechnical Engineering for Tunnelling and Trenchless Projects</p>	<p>Thurber Engineering Ltd. is a privately-owned Canadian consulting firm, founded in 1957. We provide a variety of Geotechnical, Geo-Environmental, Hydrogeological and Construction Services, in support of the transportation, municipal infrastructure and natural resources sectors. Thurber's tunnelling experience includes geotechnical investigations, installation and analysis of ground and lining instrumentation, input into lining design, and forensic assessments. Current projects of note include the Edmonton LRT Valley Line, Ottawa Confederation Line LRT, and the Eglinton-Scarborough Crosstown project in Toronto.</p>	

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<p>TNO DIANA Delftechpark 19a Delft 2628 XJ The Netherlands info@tnodiana.com 0031 (0) 88 34262 00</p> <p>Primary Contact Steve Owen Commercial Director</p>	27	27			✓	✓	✓	✓	✓	✓	<p>Finite element analysis of interaction between tunnels/structures and surrounding environment.</p> <p>Joints and tunnel segments can be modelled individually or together with associated soil/grout pressures and additional loads, that produce precise 2D or 3D output.</p>	<p>TNO DIANA is the owner and developer of the renowned finite element analysis software, DIANA, that has been utilised worldwide within the tunnelling industry for many decades and also provides consultancy services utilising DIANA. The program specialises in the analysis of a wide range of new and existing underground structures, tunnels and tunnel linings under the effect of settlement, additional loads and structural damage including seismic, freezing, flood and fire. DIANA is also used extensively in the analysis of soil and structure interaction.</p>	
<p>Tony Ridley Hyperbaric Associates Church Farm, Bramerton Road, Surlingham, Norwich, Norfolk. UK. NR14 7DE info@hyperbaric-tunnelling.com +44(0)1508 538 838</p> <p>Primary Contact Tony Ridley Director</p>	20	18	2	2	✓	✓	✓	✓	✓	✓	<p>Compressed Air Working, TBM Intervention, Occupational Safety &amp; Health, All related Supports</p>	<p>TRHA Ltd is a UK based company (Est 1997) providing specialist services to tunnelling contractors on a fully international basis. Recent / Current projects include, Los Teques Metro, Lee Tunnel, Notre Rio Medellin, Crossrail, Eccles WwTW, Shieldhall Strategic Tunnel</p>	
<p>Tunnel Engineering Consultants Laan 1914 no 35, 3818 EX Amersfoort P.O. Box 28013, 3828 ZG Amersfoort The Netherlands info@TEC-tunnel.com +31 88 3482540</p> <p>Primary Contact Hans de Wit Managing Director</p>	50	50	17	17	✓	✓	✓	✓	✓	✓	<p>Immersed tunnels, bored tunnels, cut&amp;cover tunnels, tunnel installations, operation and maintenance</p>	<p>Tunnel Engineering Consultants (TEC) is a permanent partnership between leading consultants Royal HaskoningDHV and Witteveen+Bos. TEC combines knowledge, expertise and experience of the mother companies (of approx. 8,000 professionals) within the field of large underground projects. TEC is involved in challenging projects such as the Fehmarn Belt fixed Link between Denmark and Germany, the Hong Kong-Zhuhai-Macao Fixed Link in China, the Santos-Guarujá Crossing in Brazil and the Mariefholm tunnel in Sweden.</p>	
<p>William Godwin, Consulting Geologist 25525 Shafter Way Carmel, CA 93923 bgodwinn@gmail.com +1 831 884 3308</p> <p>Primary Contact William Godwin Principal</p>	1	1	0.09	0.01					✓	✓	<p>Geotechnical Exploration HDD and Trenchless Design Construction Tunnel Mapping</p>	<p>My experience is quite broad with respect to engineering, seismic and environmental geology. As a consultant or subcontractor I provide staff augmentation to design and construction firms in project management, construction management and field exploration. I also provide consulting services to small and large clients to apply geologic principles to characterize geologic, seismic and environmental risk and hazard mitigation. Currently working on dam removal project, mapping hard rock geology, slope stability and channel restoration. Also working on large excavation soil nail wall for underground parking garage. Will soon start project for pipeline or conveyor movement of salt in Dead Sea Region of Israel, evaluating site geologic and seismic hazards</p>	

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<p>WSP   Parsons Brinckerhoff 1600 Rene-Levesque Blvd. West 16th Floor Montreal, Quebec Canada H3H 1P9</p> <p>CorporateCommunications@wspgroup.com +1 514-340-0046</p> <p>Primary Contact George A. Munfakh, PhD, PE Senior Vice President/ Director, Geotechnical &amp; Tunneling</p>		800	5305	433	✓	✓	✓	✓	✓	✓	✓	<p>Rock, soft ground, cut-and-cover, immersed tunnel, TBM, NATM, rehab, seismic, security, risk, BIM</p> <p>WSP   Parsons Brinckerhoff is a leader in tunneling and underground construction. The firm has participated in the design and construction of some of the longest, largest, deepest, and most complicated tunnels in the world, including tunnels built in hard rock, soft ground or mixed-face conditions, and using mining, boring, jacking, cut-and-cover, and immersed tunnel technology. Current and recent projects include the new Second Avenue Subway in New York City; the Stockholm City Line; the Port of Miami Tunnel; MUNI Central Subway in San Francisco; the Second Midtown Tunnel in Norfolk, Virginia; the Marmaray and Eurasia tunnels in Istanbul; the Brisbane Airport Link; and the Waterview Connection in Auckland, New Zealand. WSP   Parsons Brinckerhoff draws on the multidisciplinary resources of 32,000 employees in more than 500 offices across 39 countries worldwide.</p>
<p>WWL ALS (Wallenius Wilhelmsen Logistics Abnormal Load Services) UK Intl Limited 1501 Hedon Road Kingston Upon Hull HU9 5NX info.tunnelling@als-europe.com +44 (0) 1482 796214</p> <p>Primary Contact Paul Braithwaite Operator Special Projects</p>	85	5			✓	✓	✓	✓	✓	✓	✓	<p>Experienced operators offering comprehensive logistics solutions for delivering TBMs and equipment.</p> <p>WWL ALS is a 3PL &amp; 4PL freight forwarding company specialising in the global logistics of Project Forwarding, Capital Equipment, Abnormal Loads and Supply Chain Management. We provide the reassurance of many years' experience of successfully managing the handling and delivery of tunnel boring machines (TBMs), back-up and ancillary equipment, utilising multi-modal solutions within the UK, throughout Europe and to/from worldwide locations.</p> <p>Latest job: 595T TBM "Busy Lizzie" London Lee Tunnel project July 2015. <a href="http://www.abnormalloads.com/en/latest-news/lee-tunnel-project-tbm-busy-lizzie-returns-to-germany">http://www.abnormalloads.com/en/latest-news/lee-tunnel-project-tbm-busy-lizzie-returns-to-germany</a></p> <p>VIDEO: London Crossrail - WWL ALS project: <a href="https://www.youtube.com/watch?v=hnWOUrQghxw">https://www.youtube.com/watch?v=hnWOUrQghxw</a></p> <p><a href="http://www.wwlals.com">www.wwlals.com</a></p>

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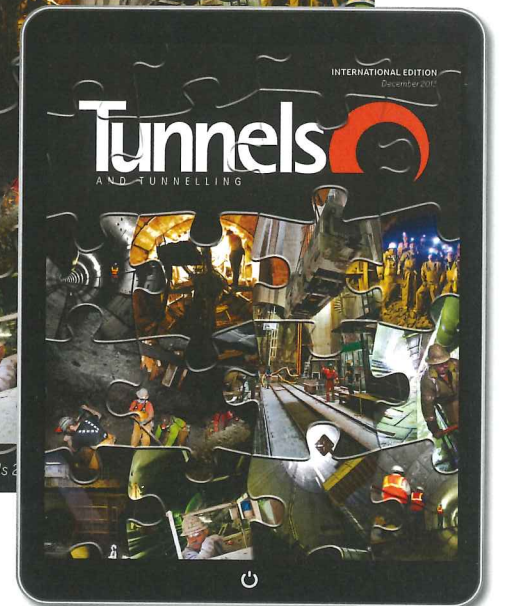
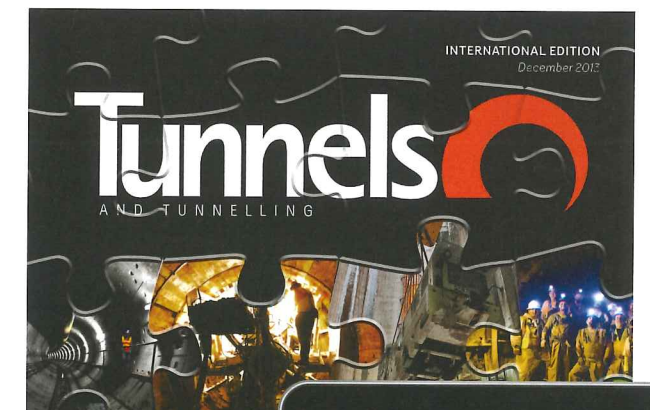
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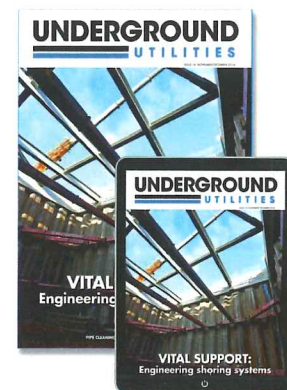
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## Contact us

Alex  
Conacher



### Editorial

**Editor**  
Alex Conacher  
Tel: +44 20 7406 6616  
[aconacher@tunnelsonline.info](mailto:aconacher@tunnelsonline.info)

Nicole  
Robinson



**North America Editor**  
Nicole Robinson  
Tel: +1 612 940 2780  
[nrobinson@tunnelsonline.info](mailto:nrobinson@tunnelsonline.info)

**Contributing Editor**  
Sally Spencer  
[sspencer@progressivemediagroup.com](mailto:sspencer@progressivemediagroup.com)

Sally  
Spencer



**Contributing Editor**  
Keren Fallwell  
[kfallwell@progressivemediagroup.com](mailto:kfallwell@progressivemediagroup.com)

**Regular Contributors**  
Adrian Greeman, Bernadette Ballantyne,  
Partick Reynolds, Rhian Owen,  
Roland Herr

Keren  
Fallwell



**Associate Publisher**  
Jon Young  
Tel: +44 20 7406 6622  
[jon.young@worldmarketintelligence.com](mailto:jon.young@worldmarketintelligence.com)

Marcela  
Ahmeti



**Sales Manager**  
Marcela Ahmeti  
Tel: +44 20 3096 2607  
[marcela.ahmeti@tunnelsonline.info](mailto:marcela.ahmeti@tunnelsonline.info)

**Account Manager**  
Tom Willard  
Tel: +44 20 3096 2608  
[twillard@tunnelsonline.info](mailto:twillard@tunnelsonline.info)

### Head Office

World Market Intelligence  
John Carpenter House  
7 Carmelite Street  
London EC4Y 0BS  
United Kingdom

Tel: +44 20 7406 6622  
Fax: +44 20 7936 6813

[www.tunnelsonline.info](http://www.tunnelsonline.info)  
[editor@tunnelsonline.info](mailto:editor@tunnelsonline.info)

### Production

**Production Controller**  
Loraine Lee  
Tel: +44 20 8269 7799  
Fax: +44 20 8269 7840  
[llee@progressivemediagroup.com](mailto:llee@progressivemediagroup.com)

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*Tunnels & Tunnelling International* ISSN (USPS 7330) 1369-3999 is  
published monthly by World Market Intelligence, Progressive House, Foots  
Cray, Sidcup, Kent, DA14 5HZ.

The US annual subscription price is \$283.49. Airfreight and mailing in the  
USA by agent named Worldnet Shipping Inc., 156-15, 146th Avenue, 2nd  
Floor, Jamaica, NY 11434, USA. Periodicals paid at Jamaica NY 11431.

US Postmaster: Send address changes to *Tunnels & Tunnelling*  
International, Worldnet Shipping Inc., 156-15, 146th Avenue, 2nd Floor,  
Jamaica, NY 11434, USA.

Subscription records are maintained at World Market Intelligence,  
Progressive House, Foots Cray, Sidcup, Kent, DA14 5HZ.

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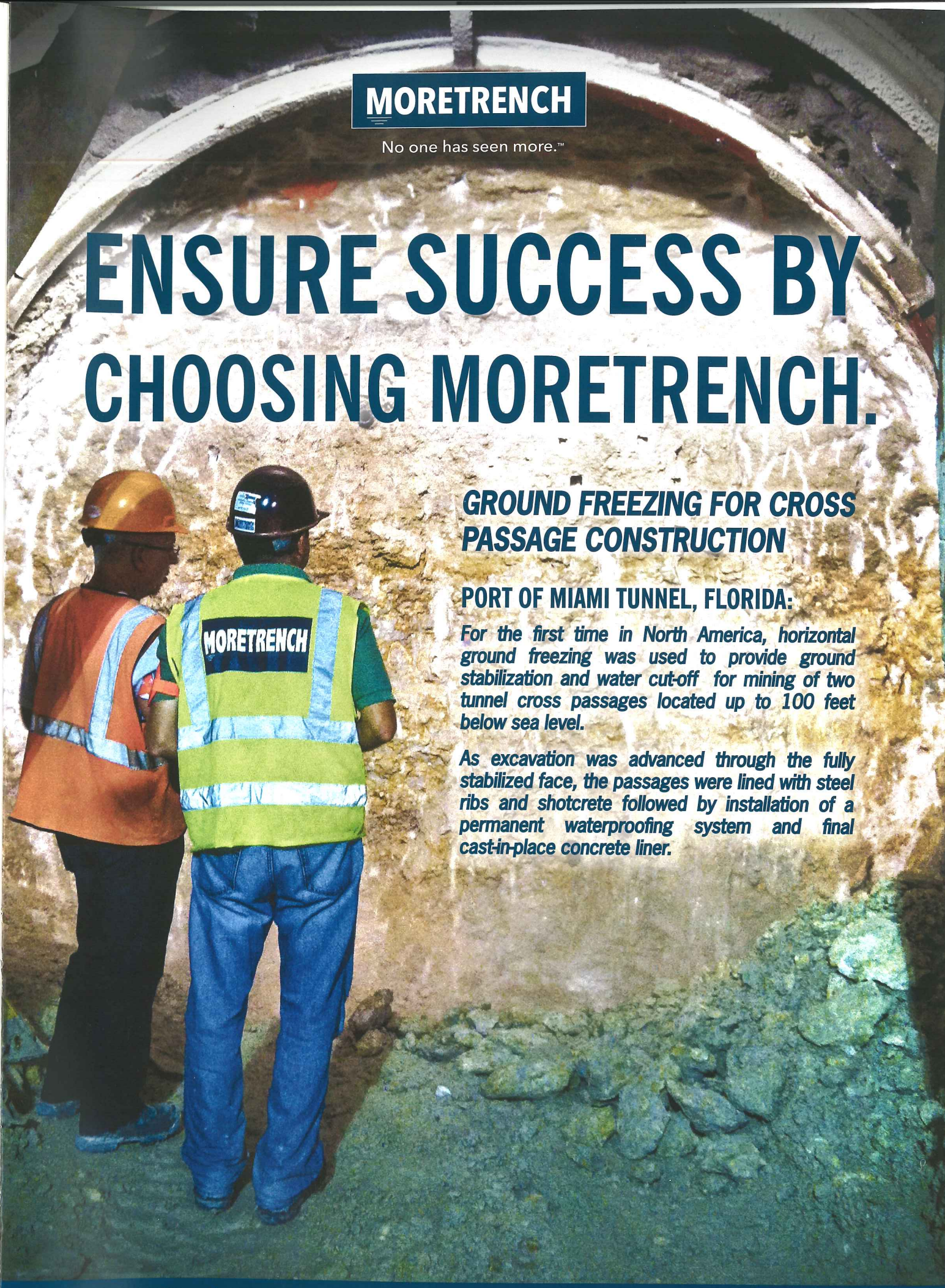
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