CIVIL SOLUTIONS

At Orica, we’re focused on developing long term partnerships which reduce total cost of your operation, improve productivity and enhance your licence to operate. We combine the progressive thinking of our Global R & D and Technical networks to find solutions to the challenges you face every day.

orica.com
MARKETS WE SERVE

UNDERGROUND CONSTRUCTION
• Tunnelling
• Cross passages
• Tunnel portals
• Shafts and sumps
• Storage caverns
• UG Stations
• Tunnel rehabilitation

CONSTRUCTION
• High rise building foundations
• Bridge abutments
• Basement car parks

CIVIL INFRASTRUCTURE
• Dams
• Road/rail cuttings
• Harbour deepening
• Pipeline excavations
• Rehabilitation
Orica’s global vision is to provide *Clever Resourceful Solutions* to customers around the world. We provide industry leading products and services in the categories of commercial explosives and blasting systems; environmental monitoring and consulting, blast consulting, rock engineering and ground control. We service the Civil Construction industry through three brands – Orica, Nitro Consult and Minova.

**OUR OFFER**

Orica is the world’s largest provider of commercial explosives and blasting systems to the civil construction, mining, quarrying, and oil and gas markets. Our global network of technical services engineers, technicians and product support specialists are dedicated to reducing your total cost of operation, improving your productivity and enhancing your licence to operate. Orica’s range includes blasting services, bulk and packaged explosives, initiators, boosters, industry leading delivery systems and a range of design, modelling and measurement technologies to optimise every blast.

[orica.com](http://orica.com)

Through Nitro Consult,™ Orica provides a comprehensive range of environmental monitoring and consultancy services for the construction and mining industries. In civil construction we work in partnership with project owners, contractors, local authorities, communities and other stakeholders to optimise the performance of blasting projects, supporting the entire project life-cycle. With specialist expertise in highly sensitive blasting, inner-city rock excavation, rock engineering and blast-measurement and control technology, Nitro Consult is your trusted partner for confidence in all civil blasting works.

[nitroconsult.se](http://nitroconsult.se)

Minova™ is a global manufacturer and supplier of chemical and mechanical earth control products, adhesives and ground support equipment. Started more than 40 years ago, Minova has manufacturing plants on five continents and operations in more than 25 countries. Minova’s industry leading product range includes resins, bolts, grouts and other speciality products to ensure your complete confidence in the waterproofing and stability of the rock surrounding your working environment. Minova services the underground mining, civil construction and infrastructure repair and remediation markets.

[minovaglobal.com](http://minovaglobal.com)
RAPID ADVANCE
Completion time and overall cost are two primary drivers of positive project outcomes. At Orica, we have the technology and expertise to ensure project delivery on or ahead of time, minimising cost and without compromising safety or design compliance.

Orica's industry leading bulk and packaged explosives, delivery systems and electronic blasting systems delivers the utmost in safety, quality and performance. Combined with Orica’s specialist technical expertise and blast design software, techniques such as multi-deck blasting and string loading can be effectively deployed to maximise tunnel advance rates and improve perimeter control in the most environmentally sensitive and geotechnically challenging situations.

Reference project
Name: Anei River Stormwater Tunnel
Location: Toyota City, Aichi Province
Solution: Achieving rapid tunnel advance rates while managing blast vibration

Products and Services
- Civec™ Control bulk system
- eDev™II Electronic blasting system
- SHOTPlus™ Blast Design software
- Multi deck blasting technique

VIBRATION CONTROL
Sophisticated technology can help you to predict and manage blast vibration and airblast, minimising the risk of exceeding allowable limits and fostering a better relationship with community stakeholders.

Orica’s electronic blasting systems (eDev™II and i-kon™II) enables safe, predictable blasting close to infrastructure, final limits and environmentally sensitive areas; design of larger, controlled blasts with increased economies of scale and reduced blast frequency; and maintenance of your licence to operate and improved community relations; asset protection and faster project completion time.

Reference project
Name: West Kowloon Terminus Station (WKT)
Location: Hong Kong
Solution: Control vibration for blasting in close proximity to people and infrastructure

Products and Services
- i-kon™II Electronic blasting system
- Senatel™ Pulsar™ packaged explosive
- SHOTPlus™ Blast Design software
- Multi deck blasting technique

ENVIRONMENTAL MONITORING
Immediate access to blast environmental results (e.g. vibration, airblast) combined with understanding of the relationship between blast designs and environmental impacts puts the project manager in complete control of community stakeholder management as well as ongoing blast optimisation.

Through Nitro Consult, Orica can monitor vibration, noise and airblast as well as dust, strain, humidity and temperature to assess the true effects of blasting on sensitive structure versus passive effects. We provide, install and oversee network connected multi-channel monitors. Monitors push data in real time to NCVIB – a multilingual online portal where project stakeholders can view blast results from any web connected device, 24/7. Software based analysis of vibration waveforms provides further information for continuous improvement.

Reference project
Name: Northern Link Expressway
Location: Stockholm, Sweden
Challenges: Over 4,000 blasts and more than 1,000 monitoring locations throughout 11 kilometers of tunnels

Products and Services
- NCVIB environmental monitoring service
- Ground investigations and structural surveys
- Installation of vibration isolation solutions
BLAST CONSULTING

The performance requirements of urban blasting are becoming increasingly demanding. With a growing number of competing objectives including vibration, fragmentation, advance rate, design compliance and cost minimisation. Orica and Nitro Consult offer a broad range of reliable technical support from our global network of experienced professionals.

Our work begins with geologic, geotechnical, feasibility and environmental pre-studies, followed by rock facility and/or rock space design, blast design, modelling and risk assessment. Acting as consultants and/or direct service providers to asset owners, designers and contractors, we can take care of everything from site investigation, design, planning, permits and structural surveys, to project implementation, final surveys and rock-facility maintenance.

Reference project:
Name
Citybanan Rail Tunnel (CRT)
Location
Stockholm, Sweden
Challenge
Complex double-track rail tunnel under central Stockholm and two underground stations
Products and Services
• NCVIB and Consulting Services
• Design, planning and construction documentation
• Test blasts, risk analysis and structural surveys
• Minova CarboStop E resin

GROUND CONTROL

Ground control is a fundamental requirement for the integrity and safety of all civil construction projects – both underground and surface. Failure to control ground presents an inherent risk of major injury or damage to infrastructure assets and incidents can cause substantial delays and interruptions which impact productivity and the economic performance of a project.

Minova is the leading specialist supplier of chemical and steel based ground support, strata injection, cementitious grouts and associated equipment and services for use in the civil construction industry.

Minova’s offer is renowned for the capability of its unique products in ground stabilization, delivering solutions for prevention of rock fall, roof control, water stopping, face stabilization, cavity filling, ground consolidation, slope stabilization, and a range of other special applications to consolidate loose ground.

Reference project:
Name
Vadlaejdi road tunnel
Location
Iceland
Solution
Assessment, application and resolution of multiple significant high volume hot water ingress issues
Products and Services
• CarboPur WX
• CarboPur WF
• CarboPur WS
• Geofoam

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