



**consult**  
international

# **Company Presentation**

## If you can think it, we can do it.

D2 Consult International GmbH is an internationally recognized company in infrastructure engineering. Bringing into balance the growing challenges of modern infrastructure, with Austrian know-how in tunnel construction, D2 Consult is a reliable partner for regional, national and international projects.



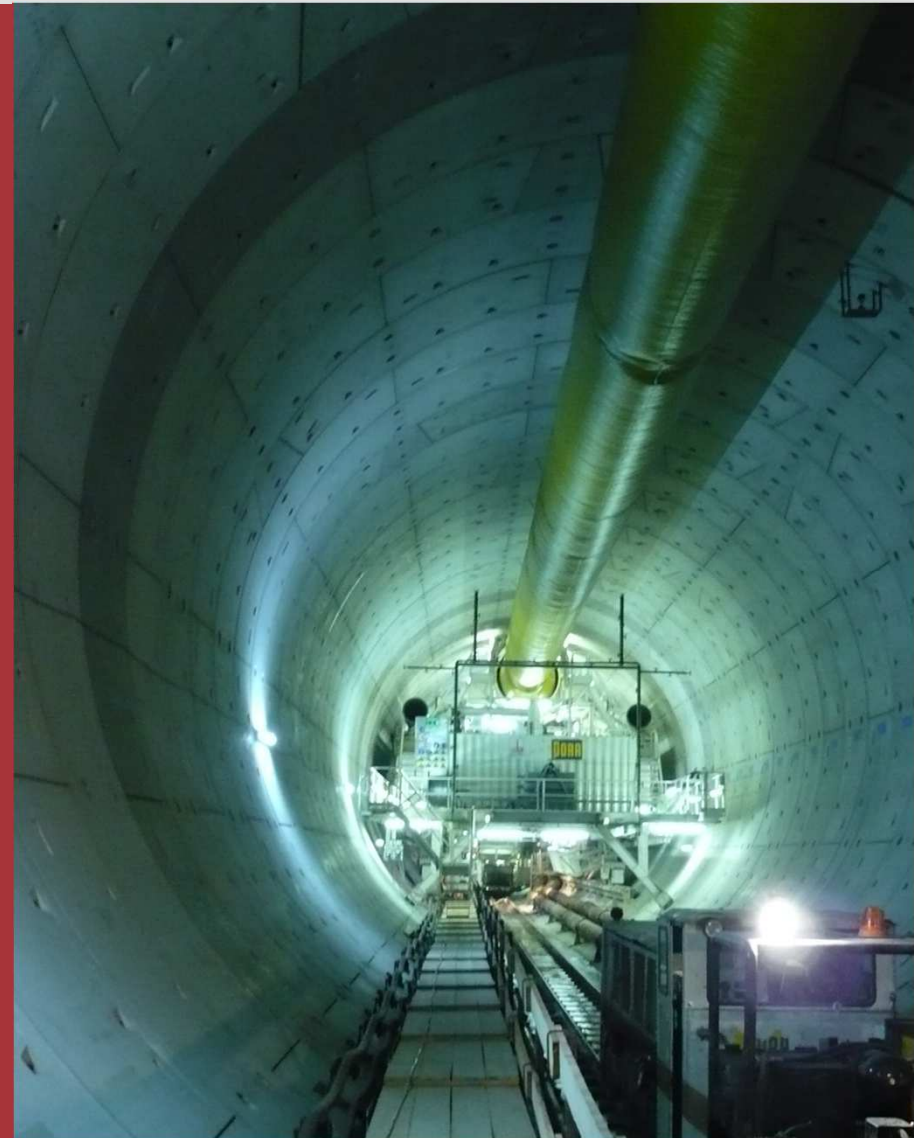
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# 1. General Introduction



## History of D2:

- D2 was founded in 1985 by Dr. Harald Wagner and Dr. Alfred Schulter as Mayreder Consult which was renamed to D2 Consult in 1994.
- In 2009 Dr. Wagner retires and DAR acquired 60 % of D2 with the local management holding 40 %. The company was managed by Dr. Alfred Schulter and Andreas Beil.
- In 2015 Dr. Schulter retired and Hannes Ertl became managing director next to Andreas Beil.

D2 Consult as an Engineering Consulting Group shows comprehensive knowledge and global experience in the field of tunnelling and geotechnics with regard to successful completion of almost 300 projects in 44 countries all over the world.

D2 Consult as a worldwide accepted tunnel expert has attained high profile skills both in conventional tunnelling/cavern design according to the principles of NATM (New Austrian Tunnelling Method) and mechanized TBM tunnelling. D2 Consult's scope of services in the tunnels and caverns field includes road tunnels, railway/metro tunnels, shafts, caverns as well as services in the field of operational & safety equipment and ventilation systems.



# 1. D2 around the world



## **D2 Consult has established following subsidiaries**

- Bangkok / Thailand
- Bogotá / Colombia
- Gurgaon / India
- Lima / Peru (in establishing)
- Santiago / Chile

## **and project offices as listed below**

- Beirut / Lebanon, with 1 expert on site
- Manali (Rohtang project) / India, with 3 experts on site



# 1. Major Clients



- The World Bank, Washington, DC / USA
- Interamerican Development Bank, Washington, DC / USA
- Asian Development Bank, Washington, DC / USA
- European Bank for Reconstruction and Development / London
- Washington Metropolitan Area Transit Authority, Washington, DC / USA
- ASFINAG, Austrian Federal Road Authority, Vienna / Austria
- Deutsche Bahn AG, German Federal Railways, Frankfurt / Germany
- ÖBB, Austrian Federal Railways, Vienna / Austria
- Ukrzaliznytsia - State Administration for Railway Transport of Ukraine / Ukraine
- Mass Rapid Transit Authority of Thailand, Bangkok / Thailand
- Border Roads Organization, Delhi / India
- Major International Contractors:
  - eg., Impregilo, Kiewit, Odebrecht, Porr, Strabag, Vinci, Pratibha, IRCON, etc.
- DAR Group: Dar Al Handasah, T.Y.Lin

# 1. Capabilities & Scope



D2 Consult is specialized in design and consultancy of underground works including tunneling utilizing the New Austrian Tunneling method as well as Tunnel Boring Machines. D2 covers also the fields of geological and geotechnical services as well as consultancy services for Electromechanical equipment and ventilation of tunnels.

## Engineering Services

- Feasibility studies
- Project developments
- Design (preliminary, tender & detailed design)
- Construction contracts
- Time and cost estimates
- Environmental impact studies
- Cost analysis
- Cost-benefit analysis
- Risk analysis

## Consulting Services

- Construction supervision
- Independent checking
- Project management
- Risk management
- Contract management
- Expertise
- Technical assistance
- Advisory services
- Arbitration
- Training, Tuition

## Future capabilities

- Consultancy for infrastructure renovation and rehabilitation
- Design of slope support and embankment design
- Consultancy services for the road sector
- Alignment design for road and rail

# 1. Qualification of Personnel



Due to the longtime worldwide experience in tunnel construction, and due to the comprehensive service offer as well as highly qualified multilingual employees, D2 Consult counts to the leading consulting firms in the tunnel construction branch.

The team is composed of civil and structural engineers, geologist and geotechnics as well as engineers, technicians and sophisticated skilled employees in the field of administration.

The office internal interlocking of draft design, planning and realization guarantees a smooth settlement of projects.

More than 26 (including site staff) employees of 10 different nations are for providing optimum development of our projects on site.

Communication in several languages, objective and emotional openness, mutual support, engagement, trust and acceptance, takeover of responsibilities, efficiency, dynamism and team spirit are not unknown words for us, but count to the most important factors of a good team.



# 1. Quality Management



- Fair cooperation with customers
- Satisfaction of the customers needs and expectations
- Quality system according to ÖN EN ISO 9001:2015

Quality system is subjected to a permanent improvement and advancement, as well as to a low maintenance.

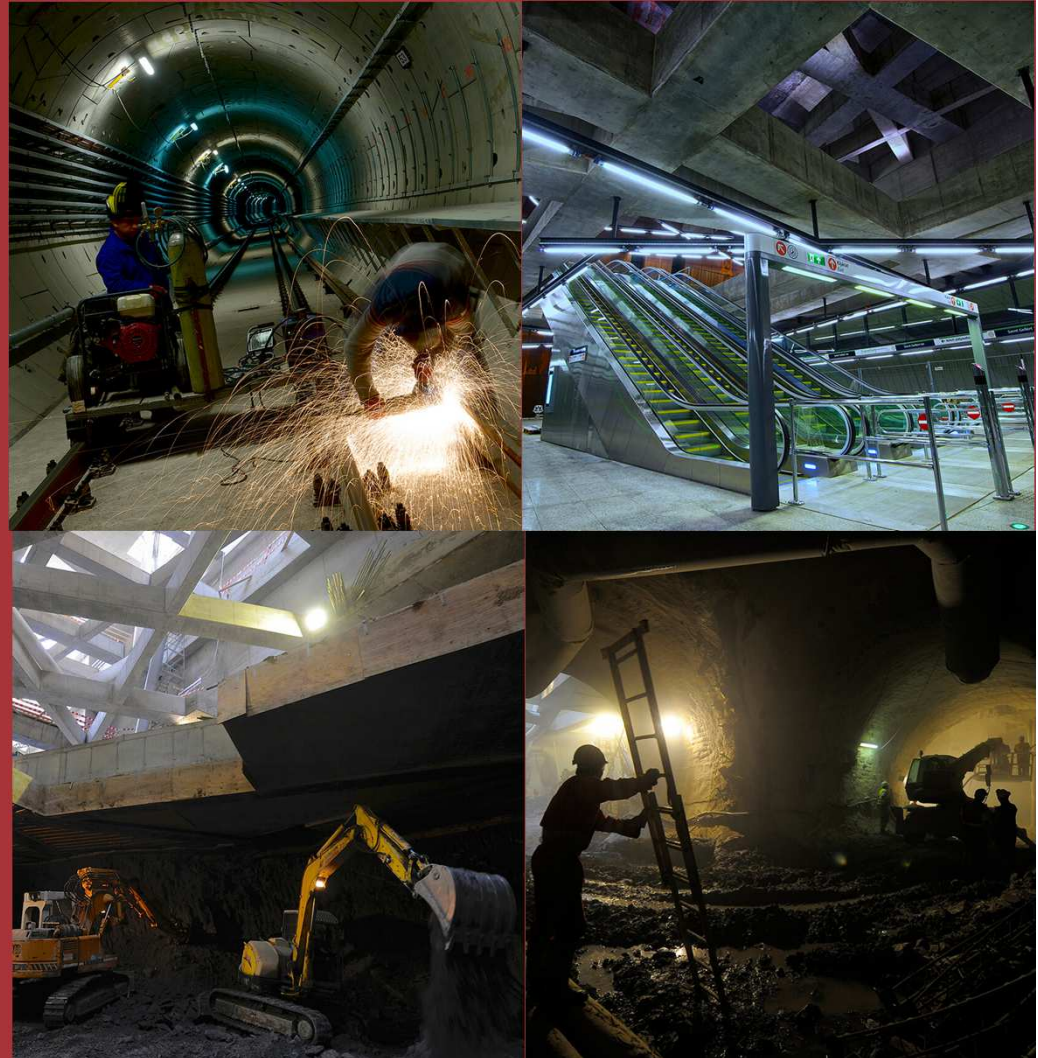
Every employee is responsible for the quality of his own working results as well as teamwork. In this sense, all team members have to contribute personal to the implementation of the quality policy and to support it in the best way.



## 2. D2 Consult Reference Projects



- 2.1 Beskyd Tunnel, Ukraine
- 2.2 High Speed Railway Line Under Inn Valey, Austria
- 2.3 Tunnels T14 & T15, India
- 2.4 Rohtang Tunnel, India
- 2.5 High Speed Railway Nuremberg – Ingolstadt, Germany
- 2.6 High Speed Railway Ebensfeld - Erfurt, Germany
- 2.7 Bosrucktunnel, Austria
- 2.8 Metro Doha Green Line, Qatar
- 2.9 Metro Bangkok - Purple Line, Thailand
- 2.10 Metro Mumbai Line 3, India
- 2.11 S1 Lobau Tunnel, Austria
- 2.12 Tunnel Buenavista, Colombia
- 2.13 Metro Caracas Suburbano, Venezuela
- 2.14 Metro Singapore – Thomson Line
- 2.15 Hai Van Pass Tunnel, Vietnam



## 2.1 Beskyd Tunnel Ukraine



**Client: State Administration for  
Railway Transport of  
Ukraine**

**Date:** 12/2007 – 12/2018

**Services provided:**

- Preparation of tender documents and prequalification
- Tendering and tender evaluation
- Supervision of works
- Technical supervision during design and construction of Beskyd Tunnel

**Volume of services:  
EUR 2,137,222**



**Project description:**

New Construction of "Beskyd Tunnel" which is situated in the South of the existing railway tunnel constructed in the 19<sup>th</sup> century. The new double track tunnel is part of the 5th Crete International Transport Corridor at the section Beskyd – Skotarskoe. The tunnel will be designed and constructed as part of a FIDIC based design-build contract. Length of Tunnel approx. 1,800 m, cross Section max. 110 m<sup>2</sup>.



## 2.2 Railway Line Inn Valley Austria



**Client: Brenner Eisenbahn GmbH**

**Date:** 10/1999 – 05/2012

### **Services provided:**

- Design review of preliminary-, tender- and final design
- Consultancy services for preparation of tender documents
- Review of structural analysis including the structural analysis for the fire loading case
- Consultancy services during construction

**Volume of services:**  
**EUR 1,592,306**



### **Project details:**

The Section Kundl/Radfeld - Baumkirchen in the Unterinntal is part of the European North-South railway axis. The section has a total length of approx. 39 km. Most parts of the section run underground respectively in open cut structures. The double track tunnels have a total length of approx. 28 km. Furthermore there are 3 investigation tunnels constructed. Their length is of approx. 9.8 km. For tunnel construction conventional excavation methods following the principals of the "New Austrian Tunnelling Method", tunnel boring machines and excavation under air pressure has been used.

## 2.3 Railway Udhampur-Baramulla India



**Client: IRCON International Ltd.**

**Date:** 12/2015 – 12/2019

### **Services provided:**

- Design (Preliminary and Final):
- Station Yards & Cavern
- Tunnel Design T-14 and T-15
- E&M Design T-14 and T-15
- Emergency Concept and Rescue Places
- Tender Consultancy
- Construction Supervision
- Consultancy during Construction

**Volume of services:**  
**EUR 1,545,082**

### **Project details:**

The whole project entails construction of rail embankments including several tunnels as well as bridges & viaducts. The current work form part of the major Udhampur – Srinagar – Baramulla Project. Purpose of this project is mainly to cater the rail connectivity to the North Western part of India. The design speed is 130 kmph (mixed traction, diesel & electrical); the maximal permissible speed is 100 kmph for mixed traction. The regional geology and tectonic framework of the area indicates that the region is capable of generating earthquake. The topography is hilly and falls in seismic zone – V.





## 2.4 Rohtang Tunnel

### India



**Client: BRO - Border Roads Org.**

**Date:** 05/2011 – 02/2019

#### **Services provided:**

- Services for performing the role of Independent Engineer as direct representative of the Client during the construction of the tunnel

**Volume of services:**  
**EUR 7,731,969**



#### **Project details:**

Construction of a single-tube two-lane bi-directional highway tunnel across the Rohtang Pass near Manali in Himachal Pradesh. The Tunnel is part of a wider project to provide an all weather road connection between the Leh region and the rest of India. The tunnel is being constructed with NATM. The south portal of the tunnel is located at of 3,055m a.s.l close to Manali (Solang Valley) and north portal of the tunnel is located on the other side of Rohtang Pass at an altitude of 3,080m a.s.l. in valley of Chandra River. The present road connection is 55km long and requires passing Rohtang Pass (3,980m). Tunnel length 8.8 km, cross section 120 m<sup>2</sup>.

## 2.5 Nuremberg – Ingoldstadt Germany



**Client: DB Deutsche Bahn**

**Date:** 10/1998 – 03/2008

### **Services provided:**

- Review of final design
- Technical and geotechnical supervision of construction
- Consulting services & documentations
- Quality management & control
- Reports & construction time and cost control
- Amendment management & contract management
- Surveying control

**Volume of services:**  
**EUR 5,137,426**



### **Project description and details:**

The new high speed railway line Nuremberg – Munich is an important part of the European infrastructure plan. The new construction of the alignment will result in faster connection between Munich – Nuremberg with regard to transport of public and goods. The section between Nuremberg and Ingolstadt has a length of 85 km and consists of 3 contracts (North, Middle and South). 2 double track, mined tunnels: Stammham (L = 1,320 m) and Geisberg (L = 3,289 m), excavation cross section 120-150 m<sup>2</sup>. 2 double track tunnels constructed in open cut method (structure): Denkendorf (L = 1,875 m), 3,030 m dams and 8,960 m open cut sections, 9 railway bridges and 5 road bridges, 1 trough building (77 m) & 550 m sound proof walls.

## 2.6 Ebensfeld - Erfurt Germany



**Client: DB Deutsche Bahn**

**Date:** 06/2003 – 12/2015

### **Services provided:**

- Review of final design
- Technical and geotechnical supervision of construction
- Consulting on foundation works
- Documentation
- Quality management and control
- Reports
- Control of time and cost
- Management of supplements

**Volume of services:**  
**EUR 1,009,101**

### **Project details:**

The new development section Ebensfeld – Erfurt is part of traffic project Deutsche Einheit No. 8 and has a total length of 105 km. The construction Lot BA 3121 is situated in the area of Coburg and consists besides of open sections also of the bridge "Itztal" with a length of approx. 868 m. The construction Lot BA 3122 consists of Bridges „Froschgrundsee“ and of the viaduct „Pöpelholz“ along of the new railway trace.





## 2.7 Bosruck Highway Tunnel Austria



**Client: Asfinag Bau Management**

**Date:** 07/2007 – 06/2017

**Services provided:**

- Attendant control during design and construction of 2nd tube and rehabilitation of 1st tube

**Technical details:**

- Length of 2nd tube 5.5 km
- Excavation cross section 90 m<sup>2</sup>
- With bottom slab 110 m<sup>2</sup>
- Total excavation 550,000 m<sup>3</sup>
- Semi-transversal ventilation

**Volume of services:  
EUR 455,454**



**Project description:**

The project contains on the one hand the construction of a second motorway tunnel tube under the „Bosruck“ including bridge construction, works of section south and north as well as the rehabilitation of the existing tunnel tube. The 2<sup>nd</sup> tube of tunnel Bosruck will run to the west of the existing tube in the east and to the west of the accompanying gallery. The driving and construction measures are especially hindered as over extent sections there are met water sensitive, swellable as well as squeezing rock properties.

## 2.8 Metro Doha, Green Line Qatar



**Client: Porr-SBG-HBK JV**

**Date:** 10/2013 – 12/2015

**Services provided:**

- Alignment Design
- Interpretation of geological
- Investigation
- Segmental tunnel Design
- Cross Passage Design
- Design of necessary Monitoring
- & Instrumentation

**Volume of services:**  
**EUR 2,688,117**



**Project details:**

The underground section of the Metro Doha Green Line starts from Mushaireb Station, moves north through Al Diwan Station, and then west through stations Rayyan/ C-Ring, Al Rayyan/ Sports RA, Al Rayyan/ Al Messila, Al Rayyan/ Al Qadeem, Education City South East, Qatar Convention Centre, and Education City Station and beyond to the trough at-grade transition. Total underground length is approximately 19km. The Mushaireb Station, located in the centre of Doha city, is the hub of the Metro network, being the major interchange station for Red Line North, Red Line South, Green Line and Golden Line.



## 2.9 Metro Bangkok, Purple Line Thailand



**Client: MRTA**

**Date:** 12/2009 – 03/2017

**Services provided:**

- Construction Supervision of E&M Works

**Volume of services:  
EUR 1,611,861**



**Project details:**

The Purple Line is aimed to serve travel demand between the northwestern suburb of Bangkok in Nonthaburi Province and southern area of Thonburi in Rat Burana District, passing Rattanakosin old quarter and many historical places in Dusit and Phra Nakhon District.

The total length of this elevated section of Bangkok's Metro System is 23 kilometers.

## 2.10 Metro Mumbai, Line 3 India



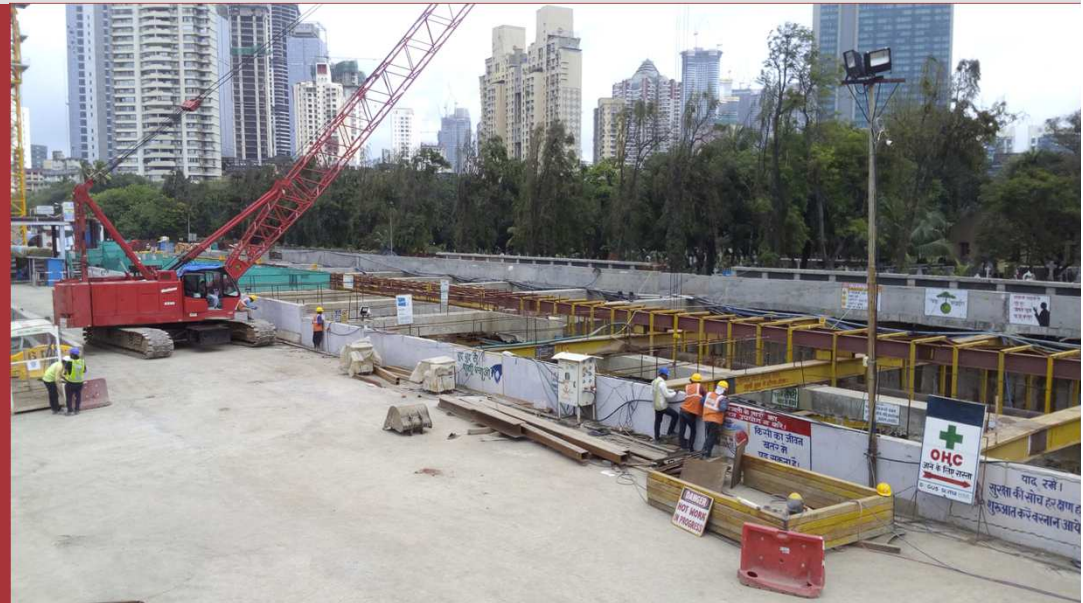
**Client: Soma – Degusa JV**

**Date: 07/2016– 07/2020**

### **Services provided:**

- Tunnel segment design incl. segment lining details
- Design of cross passages, sump pits & tunnel drainage
- Design of NATM Access Tunnels

**Volume of services:  
EUR 478,410**



### **Project details:**

Line 3 of the Mumbai Metro, also referred to as the Colaba–Bandra–SEEPZ line, is a part of the metro system for the city of Mumbai, India. When completed, the 33.5-km long line will be the first fully underground metro line in Mumbai, and in India. The project is divided into seven packages (MM3-CBS-UGC-01 to 07) out of which two have been given to D2 Consult (in JV with M/s ICT) for preparing the tender design on behalf of M/s Dogus-Soma (JV). Package 03 is 5.057 km long, and includes TBM bored tunnels and 5 stations.

## 2.11 S1 Lobau Tunnel Austria



**Client: Asfinag Bau Management**

**Date:** 07/2007 – 12/2018

### **Services provided:**

- Preliminary, Tender and Detailed Design
- Collaboration with the environmental impact study and matter laws
- Tunnel safety documentation & Concept of masses
- Risk analysis for TBM method & Design of ventilation buildings
- Structural analysis including consideration of fire loadings
- Coordination of tunnel design with ventilation, architectural and electro-mechanical requirements



**Volume of services:  
EUR 1,466,175**

### **Project details:**

In the course of construction of section S1 Schwechat – Süßenbrunn the River Danube and the National Park "Donauauen" is under crossed with the new twin-tube road tunnel "Danube-Lobau". The tunnel runs through gravel, sands as well as through silt-clayey formations. The construction water level southern of river Danube is nearly at top ground surface and in the north approx. 2.0 m under top ground surface. The driving in mining method is carried out with a max. ground water level of approx. 55 m above tunnel floor. Due to low covering and undercutting of some buildings and rivers, a drive with TBM with little settlements is intended. Length of tunnel 7.7 km, conventional 6 km, Cut & Cover 1.8 km, Diameter conventional tunnel 15 m, Cross section 176.71 m<sup>2</sup>, Overburden approx. 50 m.

## 2.12 Tunnel Buenavista Colombia



**Client: INVIAS**  
**Instituto Nacional de Vías**

**Date:** 03/1998 – 08/2003

**Services provided:**

- Preliminary- tender- and final design (in JV)
- Construction supervision and project management within assigned services "Interventoria" (in JV)

**Volume of services:**  
**EUR 1,416,618**



**Project details:**

The originally called Buenavista tunnel runs along the route Bogotá – Villavicencio. The 2 lane highway tunnel passes the major geologic fault zone of the South American Continent with both sandy water-bearing grounds as well as rocky sections with high rock pressure. The Tunnel is the longest road tunnel in South America and was constructed using the New Austrian Tunnelling Method (NATM). The tunnel has been tight and by a waterproofing membrane with geotextil between initial and final lining. Tunnel length 4.3 km, Excavation cross section 75 m<sup>2</sup>, Overburden 500 m.



## 2.13 MTS Caracas Suburbano Venezuela



**Client: DAR Al Handasah Cons.**

**Date:** 02/2011 – 12/2013

### **Services provided:**

- Conceptual, preliminary and detailed design for the tunnel sections.
- Review of different alignments and evaluation of different construction methods (NATM/TBM) in the conceptual stage.
- Design of tunnel sections by the means of NATM and TBM incl. the recommendation of the suitable TBM and segmental lining design.
- Design of portals as well as launching and receiving shafts for the TBMs.
- Risk analysis for the whole suburban railway line.

**Volume of services:  
EUR 1,756,000**



### **Project details:**

Detailed Design for the tunnel sections of the railway line Caracas - Guarenas - Guatire. The running tunnels will be constructed by TBMs of 8.12m diameter and have a length of 2 times 16km. Next to the design of the segmental lining, the design of 64 cross passages, 6 portals and one receiving shaft is part of the scope.



## 2.14 Metro Singapore Singapore

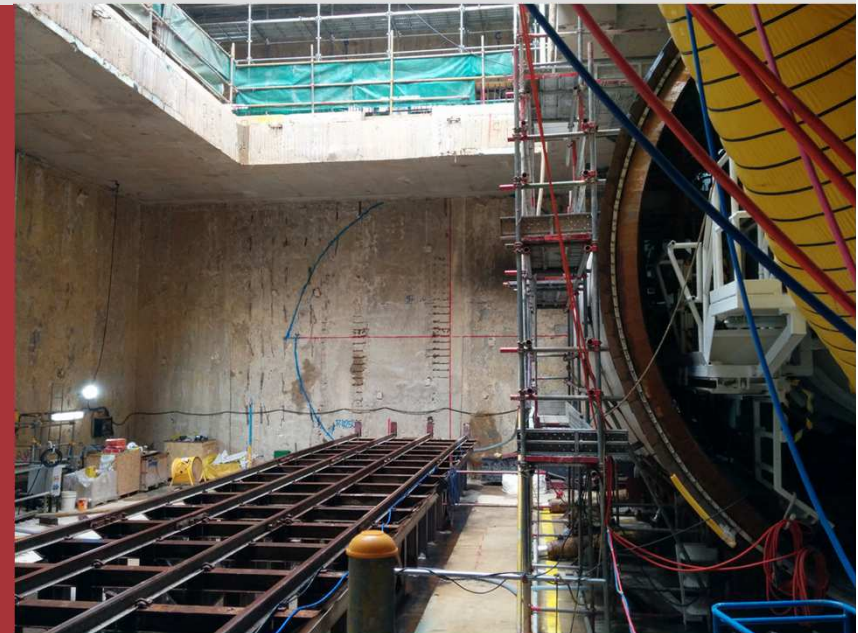


**Client: T.Y. Lin International PTE Ltd.**

**Date: 11/2010 – 02/2013**

### **Services provided:**

- Optimization of the alignment
- Assist in the preparation of requirements for geological and geotechnical site investigation
- Concept & Development of segmental lining of TBM tunnel / Cross Passages & Rescue Tunnels .
- Conceptual/Preliminary/Pre-final/Final Design of segmental lining of TBM tunnel / Cross Passages & Rescue Tunnels (structural analysis, calculations and drawings)
- Conceptual/Preliminary/Pre-final/Final Design of Interface between TBM tunnels and Launching/Receiving shafts, Interface between Escape Shaft and connecting tunnel and Interface between connecting tunnel and TBM Tunnel



### **Project details:**

The new Thomson Line from north to south, which is excavated by mechanized tunnelling method, has a track length of 34 km. Package B is one of her 4 sub sections with approx. 16 km length. The twin tube tunnels design is characterized by an excavation diameter of 65 m and overburden situation of 6-50 m. Further more cross passages between running tunnels & rescue tunnels linked to escape shafts are designed after the principles of the NATM. The geology is determined by a mixture of soft soil at surface to weathered resp. fresh granite in deeper strata.

**Volume of Services  
EUR 341,749**

## 2.15 Hai Van Pass Tunnel Vietnam



**Client: Louis Berger Group Inc.**

**Date:** 07/1998 – 12/1999

**Services provided:**

- Tender and detailed design for tunnel works
- Tunnel ventilation design
- Risk analysis

**Volume of Services  
EUR 286,605**



**Project details:**

The longest highway tunnel in Vietnam has been constructed in middle Vietnam in the vicinity of Da Nang. In addition to the single tube double-lane bidirectional tunnel with a length of 6.4 km a parallel evacuation tunnels has been constructed. Both tunnels are connected by 15 cross passages.



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