

**Curriculum Vitae (CV)**

1. **Proposed Position:** Tunnel Expert / Team Leader
2. **Name of Firm:** Neuron <sup>4</sup> Consult ZT
3. **Name of Expert:** Davorin KOLIĆ
4. **Date of Birth:** 15.01.1961      **Citizenship:** Austrian
5. **Educational Qualification:**
  - Univerity of Zagreb, Faculty of Civil Engineering “Gratuated Civil Eng.”Dipl.-Ing.; B.Sc.Thesis (1985)
  - Postgraduate Study ; M.Sc.Degree , M.Sc.Thesis
  - Ph.D.Thesis
6. **Membership in Professional Associations:**
  - Registered Chartered Engineer, Croatia (1988)
  - Registered Chartered Engineer, Austria (2003)
7. **Other Training**
  - Diverse seminars, specialization courses, Chartered engineering licence
  - Organization and lecturing on educational courses in Austrian and Croatia Chamber of Engineers
8. **Countries of Work Experience**

Austria, Croatia, Turkey, USA, Italy, France, Germany, Taiwan, South Korea, Great Britain, Singapore, Hong Kong, Belgium, PR China, Hungary, Puerto Rico, India, Sri Lanka, Bulgaria, Romania, Ukraine, Russia, Kazakhstan, Slovenia, Chile
9. **Languages**

	Reading	Speaking	Writing
Croatian	Mothers tongue	Mothers tongue	Mothers tongue
English	Excellent	Excellent	Excellent
German	Excellent	Excellent	Excellent
Slovenian	Excellent	Excellent	Excellent
Spanish	Basic	Basic	Basic
French	Basic	Basic	Basic
Italian	Basic	Basic	Basic
Russian	basic	Basic	Basic

## 10. Employment Record

From 04/1985 to 10/1991

Employer: Engineering and Designing Office (IPZ), Zagreb, Croatia

Position held: Project Engineer

From 02/1990 to 10/1991:

Employer: University of Zagreb, Faculty for Civil Engineering

Position held: University Assistant

From 10/1991 to 08/1994 :

Employer: Ingre. MAYREDER, KRAUS & Co.CONSULT, Linz, Austria

Position held: Project Engineer/Project Manager

From 08/1994 to 11/1996 :

Employer: Technical office MAYREDER BAU GmbH, Linz, Austria

Position held: Project Manager

From 11/1996 to 11/1998 :

Employer: ALPINE BAU GmbH, Linz, Austria

Position held: Project Manager

From 12/1998 to 2002 :

Employer: D2 Consult, Linz, Austria/ D2 Consult Zagreb doo, Zagreb, Croatia

Position held: Head and Partner of Croatia Branch Office, Division Managing Director

From 01/2003 to 08/2012:

Employer: Neuron Consult ZT, Linz, Austria/ Neuron Zagreb doo, Zagreb, Croatia

Position held: Founder and Owner / Managing Director

From 08/2012 to 07/2018:

Employer: GEODATA Austria GmbH, Linz, Austria/ GEODATA Tunel doo, Zagreb, Croatia

Position held: Managing Director

From 07/2018 to now:

Employer: Neuron 4 Consult ZT, Linz, Austria

Position held: Managing Director

## 11. Key Qualifications / Referenced projects

Task Assigned	Works undertaken that best illustrate capability to handle the tasks assigned
<b>Project Director Expert Tunnelling Advisor</b>	<p><b>Name of assignment or project:</b> New Railway Divaca-Koper, Slovenia <b>Year:</b> 2016-2019 <b>Location:</b> Slovenia, EU <b>Client:</b> Ministry of transport Slovenia, 2TDK <b>Main project features:</b> The new railway line of 27 km rail track with 8 double tube single track tunnels and 2 long viaducts of 550 m each. Tunnelling is on the 75% of the length of the new rail track with 3 longest tunnels with lengths 6700, 6000 and 3.8 km.. All tunnelling will be performed in NATM methodology and with northern half in karst and southern half in flysch formations. Construction 2020-2027. <b>Activities performed:</b> Leading the team of 30 experts on checking and optimizing costs and construction procedures in order to optimize all structures on the track for the overall budget of 1.4 billion EUR before the start of the construction procedure and preparation of tender documentation in 3 lots..</p>
<b>Project Director Expert Tunnelling Advisor</b>	<p><b>Name of assignment or project:</b> Hydro scheme Alto Maipo <b>Year:</b> 2013-2015, 2017 <b>Location:</b> Chile, South America <b>Client:</b> AES Gener <b>Main project features:</b> Hydro scheme eastern from city of Santiago de Chile including 2 underground hydro power plants constructed in NATM and 50 km of tunnelling (25 km as NATM tunnels and 25 km as TBM tunnels). The total construction costs are about 780 million US\$ and construction time until 2025. Project was divided between two contractors : STRABAG had Lots co.630/620A for 490 million USD\$ and HOCHTIEF constructed lots 620B/610 for 290 million USD\$. <b>Activities performed:</b> Final design, construction follow-up and assistance to the Contractor during the construction of the hydroelectric plant Alto Maipo contracts Co 630/620A. with the project value of 490 mill. USD\$. Final design of surface structures for contracts 620B/610. with the project value of 290 mill. USD\$.</p>
<b>Project Director Expert Geotechnical</b>	<p><b>Name of assignment or project:</b> Peljesac Crossing <b>Year:</b> 2016-2017 <b>Location:</b> Croatia, EU <b>Client:</b> Croatian Roads, Ministry of transport and infrastructure, Croatia <b>Main project features:</b> The bridge of 2.4 km length as a structure over 6 pylons and 7 spans is the final solution for the crossing from Mainland to Peljesac peninsula. The cross section is a steel hollow box with 4 traffic lanes, concrete pylons and foundation on 100 deep steel casing piles of 2.0 diameter and 100 m length. Structure is in construction for the period 2018-2022 <b>Activities performed:</b> Checking engineer services for the superstructure and substructure of the bridge for the final design phase. Advisory to the client for the period prior to tender preparation and concepts of 2 phase tendering with the optimization of costs construction sequences.</p>
<b>Project Manager/ Expert Tunnelling Adviser</b>	<p><b>Name of assignment or project:</b> Immersed Tubes in Split Nord Port and South Main City Port <b>Year:</b> 2013-2014 <b>Location:</b> Croatia, EU <b>Client:</b> Municipality Split, Croatia</p>

	<p><b>Main project features:</b> Conceptual design nfor 2 road/rail immersed tube tunnels : from North port Split to Kastela ,2500m long road/rail immersed tube tunnel and a road tunnel from Tunnel Marjan through the South port and connection existing road network on the east part of the city</p> <p><b>Activities performed:</b> - Conceptual design of immersed tube tunnels in Split port as basis for EU/Private financing</p>
<b>Project Director/ Expert Tunnelling Adviser</b>	<p><b>Name of assignment or project:</b> Rapid Rail Zagreb – Phase 2 : Comparative study of EU Rapid Rail systems <b>Year: 2012-2013</b> <b>Location:</b> Croatia, EU <b>Client:</b> Municipality Zagreb, Croatia</p> <p><b>Main project features:</b> Comparison of rapid rail systems in citirs of EU and direction for application in the city of Zagreb including other implications on existing transport system. Suggestions for further devlopemt of the rapis rail system using underground space.</p> <p><b>Activities performed:</b> - Comparative study and multicriterial evaluation</p>
<b>Expert Tunnelling Adviser</b>	<p><b>Name of assignment or project:</b> Railway Line Trieste-Sezana-Divaca Tunnel <b>Year: 2011-2012</b> <b>Location:</b> Slovenia, EU <b>Client:</b> Slovenian Railways, SZ PP doo</p> <p><b>Main project features:</b> New railway line from Trieste, Italy over Sezana toward Divaca and further to Ljubljana in the length of 50 km with the tunnel part crossing border of approximately 22 km length through karst conditions, double tube, single track railway tunnels</p> <p><b>Activities performed:</b> - Fesibility study with alignment options - Cost Estimation and Cost Optimization</p>
<b>Project Director / Expert Tunnelling Adviser</b>	<p><b>Name of assignment or project:</b> Railway Line Pivka-Divaca, Slovenia <b>Year: 2011-2012</b> <b>Location:</b> Slovenia, EU <b>Client:</b> Slovenian Railways, TIRING doo</p> <p><b>Main project features:</b> Old railway line needs rehabilitation of tunnel lining and sections generally of tunenls : Kriziski (330m), Jurgovski (277m), Lezeski (305m) where as the main part is the redesign of cross sections and installation of the slab-track system on the ground instead of traditionally used slippers. This is the first application of slab-rack structure and laser termography of tunnel linings in Slovenia, single tube double track tunnels more than 175 years old.</p> <p><b>Activities performed:</b> Pre-design, laser termography of lining, design and supervision during application, financial and technical control.</p>
<b>Expert Tunnelling Adviser</b>	<p><b>Name of assignment or project:</b> Railway Line Divaca-Koper , <b>Section 1 : Koper-Crni Kal, Section 2 : Crni Kal - Divaca</b> <b>Year: 2009-2011</b> <b>Location:</b> Slovenia, EU <b>Client:</b> Slovenian Railways, SZ PP doo</p> <p><b>Main project features:</b> New railway line from Slovenian port Koper toward Divaca and further to Ljubljana in the length of 30 km with the 6 conventional excavataed single track single line tunnels through karst geological conditions.</p> <p><b>Activities performed:</b> Fesibility study with alignment options according to excavation technology, main design of tunnels, cost estimation and cost optimization.</p>
<b>Project Manager /</b>	<p><b>Name of assignment or project:</b> Fehmarnbelt Fixed Link</p>

<b>Expert Tunnelling Adviser</b>	<p><b>Year: 2008-2010</b>  <b>Location:</b> Danemark- Germany crossing  <b>Client:</b> Femern Sund Belt  <b>Main project features:</b>  A NEW FIXED LINK CONNECTION BETWEEN DANEMARK AND GERMANY HAS TO BE PROVIDED IN THE LENGTH OF 19 KM OVER FEHMARNBELT CROSSING. THE LOCATION IS SPECIFIC DUE TO THE STEADY GEOLOGY, FLAT SEA BED AND CONSTANT WATER HEIGHT. STRONG WINDS AND WAVE STREAMINGS ARE SUPPORTING TUNNELLING SOLUTIONS THAT WILL PROVIDE CONSTANTLY SAFE TRAFFIC CONDITIONS. CROSSING SHOULD BE PROVIDED FOR ROAD AND RAIL TRAFFIC AND CONTRIBUTE SERIOUSLY TO THE TRAFFIC CONNECTIVITY OF THE REGION CONNECTING DANEMARK AND GERMANY.  <b>Activities performed:</b>  EXPERT EVALUATION IN THE FORM OF OPTIMIZATION AND RATIONALIZATION OF THE PROJECT HAS BEEN PROVIDED CONSIDERING DIFFERENT CROSSING OPTIONS INCLUDING: SUSPENSION BRIDGE, CABLE STAYED BRIDGE, BORED UNDERSEA TUNNEL AND IMMersed TUBE UNDERSEA TUNNEL. OPTIMIZATION WAS PERFORMED USING METHODOLOGY OF RISK ANALYSIS INCLUDING COST EVALUATION OF TOTAL CONSTRUCTION COSTS FOR ALL TYPES OF CROSSINGS GIVING IMMersed TUBE UNDERSEA OPTION AS FAVOURABLE ONE.</p>
<b>Project Manager / Expert Tunnelling Adviser</b>	<p><b>Name of assignment or project:</b>  Kowloon Eastern Railway Link, KDB400, Cherry road  <b>Year: 2005-2007</b>  <b>Location:</b> Hong Kong  <b>Client:</b> JACOBS / Kowloon-Canton Railway Corporation  <b>Main project features:</b>  A 3.8 KM NEW UNDERGROUND RAILWAY, THEREAFTER CALLED “KOWLOON SOUTHERN LINK” OR KSL, WOULD BE CONSTRUCTED TO CONNECT THE KCRC EAST TSIM SHA TSUI (TST) STATION TO THE WEST RAIL (WR) NAM CHEONG (NAC) STATION WITH ITS ALIGNMENT UNDER SALISBURY ROAD, CANTON ROAD AND THE WEST KOWLOON RECLAMATION AREA TO IMPROVE THE ACCESSIBILITY TO AND LESSEN THE TRAFFIC CONGESTIONS AT TST AND WEST KOWLOON DISTRICTS. THE CIVIL CONSTRUCTION WORKS FOR THE KSL ARE SPLIT INTO THREE DESIGN AND BUILD CONTRACTS KDB200, KDB300 AND KDB400.  <b>Activities performed:</b>  <ul style="list-style-type: none"> <li>- FINAL DESIGN OF MINED UNDERGROUND STRUCTURE UNDERCROSSING CHERRY STREET USING FREEZING OR GROUTING OPTION WITH SCL PRIMARY SUPPORT AND EXCAVATION.</li> </ul> </p>
<b>Project Manager / Expert Tunnelling Adviser</b>	<p><b>Name of assignment or project:</b>  Metro Singapore, Circle Line, Section C855  <b>Year: 2005-2006</b>  <b>Location:</b> Singapore  <b>Client:</b> JACOBS / JV Wo Hup-Alpine-Mayreder  <b>Main project features:</b>  STAGE 4 OF THE CIRCLE LINE IS COVERING RUNNING TUNNELS AND METRO STATIONS HOLLAND VILLAGE, BUENA VISTA AND NUH. THEY WILL BE ALSO STARTING POINTS FOR TBM DRIVES STARTING FROM SCL/NATM SUPPORTED CHAMBERS AT THE BEGINNING OF THE SECTION C855. THE FINAL DESIGN HAS BEEN PROVIDED AS A PART OF DB PROJECT SCHEME  <b>Activities performed:</b>  FINAL DESIGN OF PRIMARY SUPPORT FOR SCL/NATM PARTS OF STATIONS :  <ul style="list-style-type: none"> <li>• TWIN TBM LAUNCH CHAMBERS AT AYER RAJAH EXPRESSWAY</li> <li>• MALAYAN RAILWAY UNDERPINNING WORKS</li> </ul> </p>
<b>Project Manager</b>	<p><b>Name of assignment or project:</b>  Light Rail Zagreb  <b>Year: 2005-2007</b>  <b>Location:</b> Croatia, EU  <b>Client:</b> Municipality Zagreb  <b>Main project features:</b>  CITY OF ZAGREB HAS STARTED WITH THE EVALUATION OF DIFFERENT OPTIONS THAT SHOULD DEVELOP SOME RAPID TRANSIT SYSTEM THAT SHOULD SERVE AGAINST DAILY CONGESTIONS. AFTER “TRAFFIC STUDY” FINISHED IN 1999 THIS STEP HAS TO DEFINE SOME</p>

	<p>TYPE OF RAPID DAILY TRAFFIC THAT HAPPENS IN MAIN DIRECTIONS NORTH-SOUTH AND EAST –WEST. THE ANALYSES AND COMPARISONS HAVE DEPICTED THE LIGHT RAIL AS OPTIMIZED SOLUTION FOR THE FUTURE TRAFFIC SYSTEM.</p> <p><b>Activities performed:</b> CONCEPTUAL DESIGN OF 4 ALIGNMENT VARIANTS AND COST ESTIMATION WITH THE OPTIMIZATION OF CONSTRUCTION METHODS AND STRUCTURES.</p>
<b>Project Director</b>	<p><b>Name of assignment or project:</b> Peljesac Bored Tunnel Subsea crossing option, <b>Year: 2004-2005</b> <b>Location:</b> Croatia, EU <b>Client:</b> Croatian roads, PORR <b>Main project features:</b> PRELIMINARY DESIGN LEVEL OF BORED TUNNEL UNDERSEA OPTION WITH STRUCTURAL ANALYSIS AND DETAILS PROVIDING INFORMATION TO ACHIEVE LEVEL OF DETAIL TO BE ABLE TO CALCULATE AND ESTABLISH BOQ CALCULATION AND CONSTRUCTION COSTS. TWO OPTIONS DEVELOPED FOR COMPARISON: WITH SINGLE TUBE AND TWO ROAD LANES OF SMALLER SIZE 8.0 M DIA. AND LARGE SIZE WITH 4 ROAD LANES ON 2 DECKS OF 13.2 M EXC. DIAMETER.</p> <p><b>Activities performed:</b></p> <ul style="list-style-type: none"> <li>- PRELIMINARY DESIGN AND BOQ</li> <li>- CONSTRUCTION COSTS</li> <li>- CONSTRUCTION TIME-SCHEDULE</li> </ul>
<b>Project Director Team of IE (Independent Engineer) Expert Tunnels</b>	<p><b>Name of assignment or project:</b> Zagreb - Macelj Highway Project <b>Year: 2004-2007</b> <b>Location:</b> Croatia, EU <b>Client:</b> AZM Autocesta Zagreb-Macelj, Croatia <b>Main project features:</b> THE PROJECT HIGHWAY ZAGREB –MACELJ IS A CONCESSION PROJECT THAT FORESEES 24 KM OF NEW HIGHWAY IN VERY DIFFICULT HILLY AREA OF NORTHERN CROATIA TOWARD SLOVENIAN BORDER CROSSING MACELJ. MOST IMPORTANT STRUCTURES ARE 4 DUOBLE TUBE AND 2 SINGLE TUBE NATM TUNNELS AND 3 DOUBLE AND 3 SINGLE BRIDGES AS THE PART OF THE CONCESSION PROJECT. THE HIGHWAY THAT IS TO BE CONSTRUCTED IS CONSISTS OF 18 KM OF DOUBLE LANE AND 6 KM OF SINGLE LANE HIGHWAY.</p> <p><b>Activities performed:</b></p> <ul style="list-style-type: none"> <li>- FINANCIAL SUPERVISION</li> <li>- PAYMENT SCHEDULE FOLLOW UP</li> <li>- CONSTRUCTION TIME-SCHEDULE CHECK, TECHNICAL ASSISTANCE</li> </ul>
<b>Project Director Expert Tunnels</b>	<p><b>Name of assignment or project:</b> Cable Tunnel under Graz Main Railway Station <b>Year: 2003-2005</b> <b>Location:</b> Austria, EU <b>Client:</b> HLAG- Hochleistungs AG, Vienna / PORR Tunnelbau AG <b>Main project features:</b> AS THE PART OF THE NEW HIGH-SPEED RAIL LINE CALLED “KORALM RAIL LINE” FROM GRAZ TO KLAGENFURT, ONE CABLE TUNNEL UNDERNEATH THE MAIN RAILWAY STATION IN GRAZ HAD TO BE CONSTRUCTED. IT HAS THE LENGTH OF 1000 M, EXCAVATION DIAMETER OF 3.74 M THROUGH GRAVEL LAYERS WITH OVERBURDEN IN THE RANGE OF 6-15 M. THE TUNNEL HAS BEEN CONSTRUCTED USING PIPE-JACKING OF CONCRETE TUBES METHOD, WAS THE BIGGEST AT THE MOMENT PIPE-JACKING TUBE IN AUSTRIA (<math>D_{out} = 3.68m</math>) AND WAS THE FIRST TUNNEL OF AUSTRIAN RAILWAYS CONSTRUCTED USING TUNNEL BORING MACHINE (TBM).</p> <p><b>Activities performed:</b></p> <p>TENDER AND FINAL DESIGN FOR THE TUNNEL EXCAVATION AND LINING INCLUDING PIPE-JACKING PROCEDURE. QUALITY CONTROL AND QUALITY ASSURANCE OF THE INSTALLED LINING.</p>
<b>Project Director</b>	<p><b>Name of assignment or project:</b> Wienerwald Rail Tunnel <b>Year: 2003-2004</b> <b>Location:</b> Austria , EU</p>

	<p><b>Client:</b> : JV PORR-Bilfinger Berger / OBB Austrian Railways</p> <p><b>Main project features:</b>          THE WIENERWALD TUNNEL HAS BEEN CONSTRUCTED AS THE PART OF THE NEW HIGH-SPEED RAIL LINE BETWEEN VIENNA AND SALZBURG. IT IS AT THE MOMENT LONGEST TUNNEL IN AUSTRIA WITH THE LENGTH OF 13.35 KM. BOTH RUNNING TUNNELS HAS BEEN EXCAVATED WITH TBM MACHINES WITH <math>D_{exc} = 10.60</math> M. THE TUNNEL HAS BEEN LINED WITH THE DOUBLE SHELL LINING WHERE THE OUTER LINING CONSISTS OF SEGMENTAL LINING MADE OF 57 300 SEGMENTS, EACH WITH THE WIDTH OF 2.25 M FORMING 9500 RINGS. BOTH TBM TUNNELS HAVE THE LENGTH OF ABOUT 11 KM AND THE REST OF THE LENGTH IS CONSTRUCTED USING CONVENTIONAL METHODS. OVERALL PROJECT BUDGET IS 370 MILLION €.</p> <p><b>Activities performed:</b>          TENDER WINNING DESIGN FOR THE BIDDING JV PORR-BILFINGER BERGER. TENDER DESIGN HAS INCLUDED NUMERICAL ANALYSIS AND OPTIMIZATION OF SEGMENTAL LINING, EXCAVATION SEQUENCE AND QUALITY ASSURANCE WITH COST ESTIMATION.</p>
<p><b>Independent Engineer Expert Tunnels</b></p>	<p><b>Name of assignment or project:</b>          Shanxi Road Development Project Motorway  <b>Year:</b> 2001-2003  <b>Location:</b> PR China  <b>Client:</b> Shanxi Qilin Road Development Company</p> <p><b>Main project features:</b>          THE NEW SHANXI ROAD DEVELOPMENT PROJECT IS SITUATED BETWEEN TAIYUAN THE CAPITAL OF SHANXI PROVINCE AND LINFEN IN THE SOUTHEAST. THIS PART OF THE NEW HIGHWAY IS <b>176 KM LONG</b>. AMONG SEVERAL OTHER STRUCTURES ON THE HIGHWAY ROUTE, MOST IMPORTANT ONES ARE <b>5 TUNNELS</b>. FOUR TUNNELS ARE PLANNED AS DOUBLE TUBE TUNNELS AND ONE AS SINGLE TUBE. THEIR LENGTHS RANGE FROM 330 M TO 1395 M. MIDDLE PART OF THE HIGHWAY SECTION IS LOCATED IN A HILLY SURROUNDING HAVING ALL TUNNELS.</p> <p><b>Activities performed:</b></p> <ul style="list-style-type: none"> <li>- CONSTRUCTION SUPERVISION</li> <li>- TECHNICAL ASSISTANCE, TECHNICAL EDUCATION</li> </ul> <p>COST AND PERFORMANCE CONTROL</p>
<p><b>Project Manager</b></p>	<p><b>Name of assignment or project:</b>          Koralm Railway Tunnel  <b>Year:</b> 2000-2003  <b>Location:</b> Austria, EU  <b>Client:</b> OBB Austrian Railways</p> <p><b>Main project features:</b>          THE TUNNELSYSTEM KORALMTUNNEL IS A PROJECT OF A NEW HIGH-SPEED RAIL IN AUSTRIA THAT IS CONNECTING TWO CITIES IN THE SOUTH OF AUSTRIA : GRAZ AND KLAGENFURT. THE NEW RAIL LINE IS 135 KM LONG, AND THE TUNNEL SECTION THROUGH THE KORALM MASSIV IS 32 KM LONG. AFTER EVALUATION OF DIFFERENT OPTIONS TWO SINGLE TUBES HAVE BEEN CHOSEN AS THE FINAL SOLUTION AND FORTHIS PURPOSE THE FINAL COSTS OF ABOUT 1.6 BILLION € HAVE BEEN ESTIMATED AS THE OVERALL CONSTRUCTION COSTS OF THE TUNNEL PROJECT. THE CONSTRUCTION HAS STARTED IN 2008 AND IT IS PLANNED TO BE FINISHED UNTIL 2014. THE LINE HAS BEEN DESIGNED FOR THE MAX.SPEED OF 240 KM/H AND SERIOUS ADDITIONAL STRUCTURES LIKE NICHES AND MIDDLE TUNNEL FOR TRAFFIC INTERCHANGE WITH NUMEROUS CROSS ADITS HAVE BEEN PLANNED TO IMPROVE THE SAFETY LEVEL OF THE TRAFFIC IN THE TUNNEL.</p> <p><b>Activities performed:</b></p> <ul style="list-style-type: none"> <li>* CONCEPTUAL TUNNEL AND SAFETY DESIGN AND EVALUATION OF ROUTES BASED ON BEST GEOLOGICAL-ECONOMICAL PATH EVALUATION</li> <li>* COST ESTIMATION WITH THE EVALUATION OF RISKS ON THE FINAL CONSTRUCTION PRICE ESTIMATION.</li> </ul>
<p><b>Project Manager : Design NATM sections</b></p>	<p><b>Project name:</b> Light Rail Seattle  <b>Year:</b> 2000-2001  <b>Location:</b> Seattle , USA  <b>Owner:</b> Sound Transit, Seattle.  <b>Client:</b> JV Impregilo-Dumez-Modern Continental-Robinson-Parsons</p> <p><b>Main project features:</b></p>

	<p>The new light rail line in Seattle downtown through the University District with 4 underground NATM stations in soft/mixed ground through the city centre of Seattle. All stations designed to be METRO STATIONS FIRST HILL, PACIFIC STATION, 45<sup>TH</sup> STREET AND THE RUNNING TUNNELS ACCORDING TO THE NATM TECHNOLOGY. THE TUNNEL HAS A TOTAL LENGTH OF 7,3 KM. THE STATION LENGTH IS AVERAGE 180 M, EXCAVATION AREA OF THE PLATFORM TUNNEL IS 97M<sup>2</sup> AND THE SINGLE TRACK TUNNELS 32 M<sup>2</sup>. The tunnel is located in clayey and sandy soil formations with an average overburden of 65 m.</p> <p><b>Services provided:</b></p> <ul style="list-style-type: none"> <li>- TENDER DESIGN FOR METRO STATIONS AND RUNNING TUNNELS (SPECS, BOQ, COST ESTIMATES, CONSTRUCTION SCHEDULES, GEOLOGICAL REPORTS, TENDER DRAWINGS)</li> </ul>
<b>Project Manager</b>	<p><b>Project name: Tuen Mun Area 56 Underpass</b>  <b>Year: 2000</b>  <b>Location:</b> Hong Kong  <b>Owner :</b> Municipality of Hong Kong  <b>Client:</b> Jacobs / CSCI Contractors Hong Kong  <b>Main project features:</b>  CONSTRUCTION OF A VEHICULAR UNDERPASS TO SERVE THE HOUSING AREA IN THE AREA 56 TUEN MUN USING INTERLOCKED PIPE-JACKED STEEL CASINGS AS EXCAVATION SUPPORT METHOD. THE UNDERPASS IS LOCATED 25M TO THE WEST OF THE EXISTING UNDERPASS AT SO KWUN WAR ROAD. THE NEW UNDERPASS IS HAS 2-LANES TO MEET THE WIDENING REQUIREMENTS OF THE EXISTING SO KWUN WAR ROAD WHICH WILL BE EXTENDED TO FOUR LANES (TWO IN THE EXISTING UNDERPASS AND TWO IN THE NEW UNDERPASS).</p> <p><b>Services provided:</b>  CONCEPTUAL DESIGN OF UNDERGROUND STRUCTURE USING PIPE-JACKED PROTECTIVE ROOF. DEFINITION OF EXCAVATION SEQUENCES AND MEASURES OF PRIMARY SUPPORT. FINAL AND DETAILED DESIGN AND ANALYSIS.</p>
<b>World Bank Expert for Tunnel Segmental Lining</b>	<p><b>Name of assignment or project:</b>  Wanjiazhai Yellow River Diversion Project, Lot II and III  <b>Year: 1999 – 2000</b>  <b>Location:</b> PR China  <b>Client:</b> YRDPG Yellow River Diversion Project group, World Bank  <b>Main project features:</b>  THE PROJECT DIVERTS WATER FROM WANJIAZHAI RESERVOIR ON THE YELLOW RIVER TO SUPPLY WATER FOR THE THREE INDUSTRIAL AREAS OF TAIYUAN, DATONG AND PINGSHUO. Project is divided in 3 lots whereas lot II and Lot III have 80 km TBM tunnelling with single-pass segmental lining of honeycomb type 4+0.</p> <p><b>Services provided:</b></p> <ul style="list-style-type: none"> <li>- QUALITY CONTROL AND ANALYSIS OF SEGMENTAL LINING DURING DESIGN, PRECASTING, TRANSPORT AND INSTALLATION</li> <li>- VERIFICATION OF TUNNEL PROGRESS AND PERFORMANCE DUE TO THE QUALITY</li> </ul>
<b>Project Manager : Design NATM sections</b>	<p><b>Project name: Metro New Delhi, Line M1B</b>  <b>Year: 1999-2000</b>  <b>Location:</b> New Delhi, India  <b>Client:</b> JV Kajima-Mitsubishi-Marubeni.  <b>Main project features:</b>  METRO STATION AND RUNNING TUNNEL. TOTAL LENGTH OF THE CONTRACT IS 2 X 6.600 M, WITH AN INNER DIAMETER OF 5,60 M. THE GROUNDWATER TABLE IS IN AVERAGE 2 M BELOW SURFACE LEVEL AND THE OVERBURDEN IS IN A RANGE OF 10 M – 20 M.</p> <p><b>Services provided:</b>  TENDER DESIGN OF THE STATION „CHAWRI BAZAR“ WITH NATM METHOD AND RUNNING TUNNELS WITH TBM METHOD.</p>
<b>Project Manager</b>	<p><b>Name of assignment or project:</b>  Warnow Crossing Rostock, Underwater Immersed Tube Tunnel  <b>Year: 1999-2000</b>  <b>Location:</b> Germany</p>



	<p><b>Client:</b> BUNG</p> <p><b>Main project features:</b>          THE ROSTOCK TUNNEL IS A CITY TUNNEL CROSSING THE WARNOW RIVER IN THE CITY OF ROSTOCK. IT IS CONNECTING EASTERN AND WESTERN PART OF THE TOWN AND HAS 2 TUBES, EACH HAVING 2 LANES AND A CENTRAL WALL. THE TOTAL LENGTH INCLUDING APPROACHES IS 1500 M OF WHICH IS 790 IS A CLEAR IMMERSSED TUBE LENGTH. THE ROSTOCK TUNNEL WAS A FIRST BOT PROJECT IN GERMANY, CONSTRUCTION BY BOUYGUES.</p> <p><b>Services provided:</b>          CONSULTANCY SUPPORTING INDEPENDENT ENGINEER POSITION TO SECURE TECHNICAL QUALITY CONTROL FOR THE FIRST PROJECT DEVELOPED AS BOT PROJECT WHERE TECHNICAL SOLUTION IS A BASIS TO DEFINE THE FINAL TOTAL CONSTRUCTION COSTS. COMPARISON WITH OTHER POSSIBILITIES TO APPLY ON THE LOCATION AGAINST PREFERABLE IMMERSSED TUBE OPTION. REVIEW OF THE FINAL DESIGN AND EVALUATION OF SUBMITTED OFFERS INCLUDING DIFFERENT TECHNICAL SOLUTIONS FOR IMMERSSED TUBE CROSSING</p>
<p><b>Project Manager</b></p>	<p><b>Project name:</b> Metro San Juan, Tren Urbano Extension  <b>Year:</b> 1999  <b>Location:</b> San Juan, Puerto Rico  <b>Client:</b> CH2MHILL. / Tren Urbano Authority, San Juan  <b>Main project features:</b>          PARTICIPATION ON THE EXTENSION OF THE METRO LINE IN SAN JUAN CALLED TREN URBANO. INVOLVEMENT OVER BOARD OF ENGINEERING CONSULTANTS FOR THE DESIGN-/ BUILD CONTRACT. Evaluation of Minillas Extension (“Minillas” &amp; “San Mateo” Stations and 1 cross over structure) using NATM design and construction techniques using risk analysis methods.  <b>Services provided:</b></p> <ul style="list-style-type: none"> <li>- DESIGN REVIEW</li> <li>- CONSULTANCY SERVICES</li> <li>- RISK ANALYSIS</li> </ul>
<p><b>Design Review / Checking Engineer Tunnels</b></p>	<p><b>Name of assignment or project:</b>          Metro 4 Line Budapest  <b>Year:</b> 1998-1999  <b>Location:</b> Hungary, EU  <b>Client:</b> DBR Metro Budapest- Louis Berger  <b>Main project features:</b>          THE SECTION HAS A TOTAL LENGTH OF 7,3 KM AND CONSISTS OF 10 UNDERGROUND METRO STATIONS AND RUNNING TUNNELS. THE STATION LENGTH IS BASED ON THE PLATFORM LENGTH OF 80 M, THE LENGTH OF RUNNING TUNNELS VARIES BETWEEN 300 M AND 1.400 M, CONVENTIONALLY CONSTRUCTED. THE EXCAVATION DIAMETER OF TUNNELS IS 6,0 M, TBM EXCAVATION OF ALL RUNNING TUNNELS.  <b>Services provided:</b></p> <ul style="list-style-type: none"> <li>• CONSULTANCY SERVICES AND CHECKING</li> <li>• DESIGN REVIEW</li> </ul> <p>RISK ANALYSIS OF UNDERCROSSING DANUBE RIVER</p>
<p><b>Project Manager – Construction Site</b></p>	<p><b>Name of assignment or project:</b>          Wanjiazhai Yellow River Diversion Project, Lot I  <b>Year:</b> 1997-1998  <b>Location:</b> PR China  <b>Client:</b> YRDPG Yellow River Diversion Project group, World Bank  <b>Main project features:</b>          THE WANJIAZHAI YELLOW RIVER DIVERSION PROJECT IS A LARGE-SCALE PROJECT LOCATED IN THE NORTHWEST OF SHANXI PROVINCE. THE PROJECT IS DIVIDED IN 3 LOTS WHEREAS LOT 1 COVERS 2 UNDERGROUND PUMPING STATIONS USED TO PUMP THE WATER FROM THE YELLOW RIVER ON THE TOP OF THE HILL. ALL APPROACHING TUNNELS AND UNDERGROUND</p>

	<p>CAVERNS ARE CONSTRUCTED CONVENTIONALLY AS NATM STRUCTURES USING DRILL-AND-BLAST.</p> <p><b>Services provided:</b></p> <ul style="list-style-type: none"> <li>- Project management on the site</li> <li>- Organization of the site and performance</li> </ul> <p>Time schedule follow-up and cost control</p>
<p><b>Project Manager</b></p>	<p><b>Name of assignment or project:</b> Maliakos Gulf Crossing , Immersed tube undersea option <b>Year: 1997-1998</b> <b>Location:</b> Greece <b>Client:</b> Hochtief – Vinci JV, sub Mayreder-Alpine- Besix <b>Main project features:</b> AS THE PART OF A NEW MALIAKOS-KLEIDI TOLL MOTORWAY IN THE NORTHERN GREECE NEAR THESSALONIKI A 13 KM ROAD LINK INCLUDING CROSSING UNDERNEATH GULF OF MALIAKOS WAS CONSTRUCTED AS A PPP PROJECT BY JV OF HOCHTIEF AND VINCI CONSTRUCTION. THE CONCESSION HAS DURATION OF 30 YEARS STARTING IN 1997. IMMERSSED TUBE CROSSING OPTION HAS BEEN CHOSEN AS THE ONE TECHNICALLY AND ECONOMICALLY MOST FAVOURABLE AND HAS BEEN EVALUATED PRIOR TO THE START OF THE DESIGN, FINANCE, BUILD AND OPERATE, TRANSFER CONTRACT THAT IS SHORTENING A WAY TOWARD SOUTH WITHIN A TRANS-EUROPEAN ROAD NET (TEN).</p> <p><b>Services Provided:</b> CONSULTANCY SERVICES ON EVALUATION OF DIFFERENT CROSSING OPTIONS WITH DESIGN REVIEW, TRAFFIC DATA CO-EVALUATION, PREPARATION OF BIDDING DOCUMENTS FOR CONTRACTORS, TECHNICAL EVALUATION OF CONSTRUCTION METHODOLOGIES, DETERMINATION OF OPERATION AND MAINTENANCE OPTIONS. DURING THE PREPARATION OF BIDDING AND CONTRACTUAL DOCUMENTS DIFFERENT OPTIONS WERE INVESTIGATED IN ORDER TO OPTIMIZE OVERALL PROJECT CONSTRUCTION COSTS FOR THE CLIENT AND CONTRACTOR JV INVESTIGATION POSSIBLE DEVELOPMENT OF RISK SCENARIOS AND THEIR ECONOMICAL EVALUATION THAT COULD INFLUENCE OVERALL CONSTRUCTION COSTS. TEHNICAL SOLUTIONS WERE DEFINED WITH THE OPTIMUM USAGE OF CONTRACTORS TECHNOLOGY AND MINIMIZING PRODUCING COSTS.</p> <p>-</p>
<p><b>Project Manager</b></p>	<p><b>Name of assignment or project:</b> Metro Singapore, North-East Line,Section C710 <b>Year: 1996-1997</b> <b>Location:</b> Singapore <b>Client:</b> JV Gammon-Kvaerner Cementation-Trafalgar House-Mayreder <b>Main project features:</b> CONTRACT 710 RUNS FROM OUTRAM PARK STATION TO THE WORLD TRADE CENTRE A DISTANCE OF APPROXIMATELY 2950 M. THE PROPOSALS ARE FOR TWIN TBM-DRIVEN CIRCULAR TUNNELS OF 5.8 METERS IN DIAMETER WITH DEPTH TO AXIS OF BETWEEN 16-32 M PASSING THROUGH ZONES FROM MODERATELY WEATHERED ROCK TO CLAYS AND SANDS. OUTRAM PARK STATION TO BE CONSTRUCTED IN OPEN CUT.</p> <p><b>Services Provided:</b> TENDER DESIGN SERVICES : TWIN TBM RUNNING TUNNELS DESIGN RISK ANALYSIS FOR TBM TUNNELLING AND OPEN CUT STATION</p> <p>-</p>
<p><b>Project Manager</b></p>	<p><b>Name of assignment or project:</b> <b>Sewer VL-10 Troncon Central, Paris</b> <b>Year 1995-1996</b> <b>Location: Paris, France</b> <b>Client: JV Bouygues- Fougerolle</b> <b>Main project features:</b> SEWER TUNNEL IS STRETCHING IN THE SUBURB THIAIS OF THE PARIS AND IS THE TUNNEL OF 2680 M CONSTRUCTED WITH A EPBM MACHINE THROUGH CLAYEY AND MARLY FORMATIONS WITH 20-25 M OVERBURDEN USING ONE PASS WATERPROOFED SEGMENTAL LINING OF 3.70 M OUTER DIAMETER AND WIT H25 CM OF LINING THICKNESS.</p> <p><b>Services provided:</b> - DESIGN REVIEW AND CHECKING OF THE FINAL DESIGN</p>

	- QUALITY ASSURANCE /QUALITY CONTROL PROGRAM FOR PRECASTING AND INSTALLATION OF THE LINING.
<b>Project Manager</b>	<p><b>Name of assignment or project:</b>  <b>Shin Dang – Han Nam, Cable tunnel Seoul</b>  <b>Year 1995-1996</b>  <b>Location:</b> South Korea  <b>Client:</b> SKEC - Sunkyong Engineering Corporation  <b>Main project features:</b>  Hard rock TBM excavation through granite formations with fissures and a lot of water and installation of one-pass waterproof segmental lining 25 cm thick, , 3.30 m outer diameter in the legh of 3300 m of cable tunnel below the central hill in Seoul, S.Korea.  <b>Activities performed:</b>  Final and detailed design of segmental tunnel lining for TBM drive in hard rock.  Construction supervision and advisory.</p>
<b>Project Manager</b>	<p><b>Name of assignment or project:</b>  Metro Lille, Ligne 2, Section “F”  <b>Year 1993-1995</b>  <b>Location:</b> Lille, Italy  <b>Client:</b> Bouygues / Communaute Urbaine de Lille  <b>Main project features:</b>  SUBWAYTUNNEL WITH A LENGTH OF 2.240 M, INNER DIAMETERDER 6,80 M, SEGMENT THICKNESS 34 CM, RING PARTITION 6+1, RING CONNECTION BY PLASTIC DOWELS, ARRANGEMENT OF TONGUE AND GROOVE IN THE RADIAL JOINT. TWO TBM DRIVEN TUNNELS WITH PRECAST CONCRETE LINING SYSTEM. ASSISTANCE TO CONSTRUCTION MANAGEMENT  <b>Services provided:</b>  - DESIGN REVIEW OF TUNNEL LINING  SITE CONSULTANCY DURING CONSTRUCTION</p>
<b>Project Manager</b>	<p><b>Name of assignment or project:</b>  <b>Railway Tunnel RER “E”, EOLE Line, Lot 35 B</b>  <b>Year 1993-1996</b>  <b>Location:</b> Paris, France  <b>Client:</b> JV DG Construction-Lodigiani  <b>Main project features:</b>  DETAIL DESIGN AND CONSTRUCTION CONSULTANCY FOR AN INNERURBAN RAILWAY TUNNEL WHICH CONNECTS THE TWO STATIONS OF ”ST.LAZARE - CONDORCET“ AND ”NORD - EST”. THE TUNNEL HAS A LENGTH OF 2x1.670M, AN INNER DIAMETER OF 6,4 M, A SEGMENT THICKNESS OF 35CM AND AN OVERBURDEN BETWEEN 22M AND 28M.  <b>Services provided:</b>  - DETAILED DESIGN OF TUNNEL LINING  - STRUCTURAL ANALYSIS  - CONSTRUCTION CONSULTANCY ON SITE</p>
<b>Project Manager</b>	<p><b>Name of assignment or project:</b>  Ayrimi-Adana –Gaziantep Motorway and Izmir Ring Road Motorway  <b>Year 1991-1994</b>  <b>Location:</b> Turkey  <b>Client:</b> TCK General Directorate of Highways; Min.of Public Works Turkey  <b>Main project features:</b>  Tunnels Adana P3a, P3b,P4 on Adana-Gaziantep Motorway and Tunnels Balcova P1,P2 and P3 on Izmir Ring Road, all double track 3-lane tunnels in different lengths from 500- 2200 m. The excavation was done as a mined tunnel in top-heading and bench/ invert excavation sequence following conventional NATM tunnelling principles.  <b>Services provided:</b>  Preliminary Design  Final and Detailed Design for construction, as-built drawings.</p>
	<b>Many other international underground and tunnelling projects.</b>

## 12. Books / Guidelines :

- Kolic et al. : “Cost Estimation for the Transport Infrastructure, Austrian Geotechnical Society, Salzburg, October 2005
- Kolic et al. : „State-of-the-art Segmental Lining“, Austrian Concrete Society, ÖVBB, Wien, December 2005
- Kolic et al. : „Guidelines for Tunnel Segmental Lining“, Austrian Concrete Society, ÖVBB, Wien, March 2009
- Hudec M, Kolic D, Hudec S. : “TUNNELS-Excavation and primary support”, HUBITG, Zagreb June 2009, ISBN 978-953-55728-1-7
- Kolic D, editor : “USING UNDERGROUND SPACE”, ITA Croatia-HUBITG, Zagreb April 2011, ISBN 978-953-55728-6-2
- Kolic D, editor : “UNDER CITY”, ITA Croatia-HUBITG, Zagreb April 2012, ISBN 978-953-55728-7-9
- Kolic D, editor : “TUNNELLING IN MEDITERANEAN REGION”, ITA Croatia-HUBITG, Zagreb May 2013, ISBN 978-953-55728-9-3
- Kolic D, editor : “TUNNELS - Selected Case Studies from Croatia”, ITA Croatia-HUBITG, Zagreb June 2013, ISBN 978-953-55728-4-8
- Kolic D, editor : “ZAGREB UNDERGROUND”, ITA Croatia-HUBITG, Zagreb March 2014, ISBN 978-953-55728-8-6
- Kolic D, editor : “SEE TUNEL”, WTC2015, ITA Croatia-, Zagreb May 2015, ISBN 978-953-55728-5-5
- Kolic D, editor : “UNDERGROUND STRUCTURES IN KARST”, ITA Croatia-, Split, March 2016, ISBN 978-953-58909-0-4
- Kolic D, editor : “SEE TUNNEL 2017 Zagreb”, ITA Croatia-, Zagreb, May 2017, ISBN 978-953-58909-2-8

More than 130 Scientific and technical articles about conventional and mechanized tunneling on high-speed railway and metro projects presented and published in international journals and on scientific congresses and symposia.

Lectures on different Universities and Engineering Chambers as :

- Politecnico Torino, Master Study “TBM Technology”
- University Salzburg, Master Study “Intercultural Competence”
- Technical University Vienna : Master study “International Project Development”
- University Split : Pre-graduate study , “TBM Tunnelling”

## 13. Memberships :

Croatian HIS (1985); IABSE (1990) ; Chamber of Engineers Austria (2003) ; ÖIAV Austira (1998); Geotechnical Society Austria (ÖGG) (2001) ; (ITA-AITES) (2001), Croatian Geotechnical Society (HGD) (2006)

- President of ITA Croatia-Croatian Association for Tunnels and Underground Structures ([www.itacroatia.eu](http://www.itacroatia.eu)) (2009-2020)
- Member of Executive Board ITA-AITES (2012-2019)

*I declare / certify that this information correctly describes my qualifications and experience.*

Date: 22/11/2022

Name and Surname  
Davorin KOLIC

