

## EXPERTISE

- Project management of road, highway and railway complex projects including external and underground works; technical support for the Contractor and for the Owner.
- Risk-assessment for geotechnical and underground works.
- Geotechnical and structural design (basic design, final design, site design) of underground works, including mined and cut-and-cover tunnels, and of surface works (retaining walls, foundation works, slope engineering).
- Tunnel refurbishment and restoration design.
- Monitoring design and interpretation.
- Numerical analysis.
- Technical assessments for insurance purpose.

## SUMMARY

- NICOLA AVAGNINA is a geotechnical and tunnelling consultant with over 15 years of experience.
- Since 2009 he works as a freelance consultant specialized in tunnelling and underground works design integrated in road, highway and railway projects, and also provides consultant services for technical control for insurance purposes (Ethiopia, Italy, Portugal, Algeria, Poland) for a major Italian company.
- Before, Nicola has been working as project manager and tunnelling designer firms for over 11 years, having been involved on a range of Italian and overseas civil and infrastructural projects.
- Chartered engineer since April 1998, Nicola is member of SIG (Italian Tunnelling Association).
- He attended advanced courses in Risk Engineering and in Forensic Engineering.

## MAIN PROJECTS

- STEP T-02 SEWER PROJECT IN ABU DHABI, EAU.
- BELES MPP AND GILGEL GIBE II HPP, ETIOPIA.
- SALERNO-REGGIO CALABRIA HIGHWAY, ITALY.
- OMEGNA RING-ROAD, ITALY.
- MILANO-LECCO RAILWAY, ITALY.
- CENTRAL RAILWAY SYSTEM, VENEZUELA.
- METRO DO PORTO, PORTUGAL.
- EGNATIA ODOS, GREECE.

## ATTACHMENT

- Detailed Curriculum Vitae (n.7 pages).

**Ing. Nicola AVAGNINA**

MAIN OFFICE: TURIN, ITALY

MOB. +39 338 775 4415 – FAX +39 011 0202 623

E-MAIL [nicola.avagnina@fastwebnet.it](mailto:nicola.avagnina@fastwebnet.it) - WEB [www.avagnina.webs.com](http://www.avagnina.webs.com) - <http://it.linkedin.com/in/avagnina>

V.A.T. n°. IT09691760012 - ITALIAN FISCAL CODE: VGNNCL71S29F351F

Nicola AVAGNINA



## CURRICULUM VITAE

### Mr. Nicola AVAGNINA

#### PERSONAL INFORMATION

**Mobile** +39 338 775 44 15  
**Fax** +39 011 0202 623  
**E-mail** [nicola.avagnina@fastwebnet.it](mailto:nicola.avagnina@fastwebnet.it)  
**Web** [www.avagnina.webs.com](http://www.avagnina.webs.com) - <http://it.linkedin.com/in/avagnina>  
**Date of Birth** 29<sup>th</sup> November 1971  
**Nationality** Italian  
**V.A.T. number** IT09691760012  
**Italian fiscal code** VGN NCL 71S29 F351F

#### LANGUAGES AND LEVEL OF KNOWLEDGE

<i>Language</i>	<i>Reading</i>	<i>Speaking</i>	<i>Writing</i>
Italian	Mother tongue		
English	Good	Good	Good
Spanish	Good	Good	Good
Portuguese	Good	Fair	Fair
French	Fair	-	-

#### FIELDS OF SPECIALIZATION

- Project management of road, highway and railway complex projects including external and underground works; technical support for the Contractor and for the Owner.
- Geotechnical and structural design (basic design, final design, site design) of underground works, including mined and cut-and-cover tunnels, and of surface works (retaining walls, foundation works, slope engineering).
- Tunnel refurbishment and restoration design.
- Monitoring design and interpretation.
- Numerical analysis.
- Technical assessments for insurance purpose.

#### EDUCATION AND ACADEMIC QUALIFICATIONS

- April 1998 Chartered engineer
- Oct. 1997 Polytechnic University of Turin - B.Sc. Environmental Engineering, 1<sup>st</sup> class degree.

#### FURTHER EDUCATION

- March-April 2011 Advanced course – Forensic Engineering: methodologies for construction claims (GEAM, Polytechnic University of Turin )
- Nov. 2009 – Sept. 2010 Advanced course - Risk Engineering (CINEAS, Polytechnic University of Milan)
- Oct. 2009 Workshop on "Tunnelling lining" (Italian Tunnelling Society – Bologna).
- May 2006 Workshop on "Safety during Construction and Exploitation of Road and Railways Tunnels" (Italian Tunnelling Society – Turin)
- Nov. 2003 Workshop on "Tunnel water-proofing systems" (Italian Tunnelling Society – Milan)

- May– Oct. 2003      Advanced course on "Safety and health coordination during design and construction" (Turin Foundation of Chartered Engineer)
- June 2002      Course on Italian Public Works Norms (Turin Foundation of Chartered Engineer)
- June 2001      Course on "Slope stability analysis" (Polytechnic University of Turin)
- Feb. 2000      Course on "Foundation and retaining structures stability design" (Polytechnic University of Milan)
- Sept. 1996      Course on "Investigation and observation in Rock Mechanics" (EUROCK '96, Turin)

## CAREER HISTORY

April 2009 → present  
 September 2007 → April 2009  
 August 1998 → June 2007

**FREELANCE GEOTECHNICAL AND TUNNELLING CONSULTANT – Turin**  
**DMS GEOTECHNICAL ENGINEERING S.R.L. – Rome**  
**Position: Project Manager; Project Engineer**  
**GEODATA ENGINEERING S.P.A. – Turin**  
**Position: Project Manager; Project Engineer**

## WORKS UNDERTAKEN

**FREELANCE GEOTECHNICAL AND TUNNELLING CONSULTANT ([WWW.AVAGNINA.WEBS.COM](http://WWW.AVAGNINA.WEBS.COM)),  
 TURIN (2009 → PRESENT)**

Jan. 2012 → in progress	Italy
Geotechnical Designer	
<b>KIENS RING ROAD (2 km, including 1 tunnel) – 30 M€</b>	
Basic and final design	
Client: Provincia Autonoma di Bolzano	
JV: Kiens Engineering (Prof.Ing. Sebastiano PELIZZA, Dr.Ing. Nicola AVAGNINA, Studio Georisk Dr.Geol. Daniele BATTAGLIA, Dr.Ing.Arch. Lucio BERTOTTI, Dr.Ing. Adriano FRAGIACOMO, Dr.Ing. Marco PUCCINELLI, STAIN ENGINEERING S.r.l.)	
Feb. 2011 → in progress	Italy, Algeria, Portugal, Poland, Romania, Ethiopia
Risk consultant	
Jun. 13 → in progress	<b>GRAND ETHIOPIAN RENAISSANCE DAM – ETHIOPIA –</b>
Contractor: Salini Impregilo, Italy	
May 13 → in progress	<b>METRO OF BUCAREST– LINE 4 and LINE 5 –</b> Contractor: JV
"ASTALDI - S.C. SOMET - S.C. TIAB - S.C. UTI"- Romania	
Nov. 11 → in progress	<b>METRO OF WARSAW – LINE II, CENTRAL SECTION (tot: 6,3 km; 4,2 km of twin bored tunnel, n.7 cut and cover stations) –</b> Contractor:
Consortium AGP Metro Polska S.C. – Poland	
Nov. 11 → in progress	<b>NEW RAILWAY SAIDA/MOULAY-SLISSEN (120 km) –</b>
Contractor: Astaldi S.p.A. – Algeria	
Aug. – Sept. 11	<b>SCUT AÇORES - SÃO MIGUEL ISLAND HIGHWAY (120 km) –</b> Contractor: Ferrovia Agroman S.A. – Azores Island, Portugal
Jul. 11 → in progress	<b>NEW RAILWAY ARCISATE-STABIO (Italy → Switzerland) – Stretch between bridge on Olona river and Italian frontier (tot: 8 km; 2,0 km in tunnel) –</b> Contractor: I.C.S. Grandi Lavori S.p.A. – Italy
Mar. 11 → in progress	<b>NEW JUNCTION BETWEEN ROAD SS. 36 "DELLO SPLUGA" AND MILAN HIGHWAY SYSTEM (includes 1,8 km of twin-bored cut and cover tunnel) –</b> Contractor: Impregilo S.p.A. – Italy
Feb. 11 → in progress	<b>BOLOGNA-BARI-TARANTO MOTORWAY, Lot 2 Cattolica-Fano (L=28 km; includes 1 twin-bored tunnel) –</b> Contractor: Pentapoli S.c.a.r.l.

Client: PROTOS S.p.A., Rome <i>Technical monitoring finalized to the evaluation of insurance risk – Identification of technological, organizational and contractual hazards and risk assessment.</i> <i>Design appraisal report and site monitoring visits during construction in order to assess risk evolution.</i>	
Jun. – Jul. 2011	Italy
Geotechnical Consultant	
<b>National Flood Relief Project (NFRP) - Design and build of Birkirkara, Għira, Wied Is-Sewda tunnels (Malta)</b> Geotechnical Consultancy for the revision of basic design of tunnel Client: Ing. Marco PUCCINELLI for JV ELBROS – OLIDRAG <i>Design of tunnel primary and final support systems and proposal of constructions optimizations</i>	
Apr. – May 2011	Italy
Geotechnical Consultant	
<b>ANAS - SS 90 "delle Puglie" ring road (DG 06/10) – 8 km, including 3 tunnels</b> Geotechnical Consultancy for the revision of geotechnical design Client: IPRO S.r.l. - ITALIANA PROGETTI	
Dec. 2010 - Jan. 2011	Italy
Tunnel Designer	
<b>ANAS – Junction between Licodia Eubea Road and Palermo/Catania Highway (PA 05/10)</b> Geotechnical Consultancy for the revision of basic design of tunnel Client: Vidoni S.p.A. (Contractor) <i>Design of tunnel primary and final support systems and proposal of constructions optimizations (in JV with Prof. Eng. S. Pelizza and with Eng. M. Puccinelli).</i>	
Sept. 2010	Italy
Tunnel Designer	
<b>ANAS - Vittorio Veneto ring road (VE 13/09)</b> Geotechnical Consultancy for the revision of basic design of tunnel Client: Vidoni S.p.A. (Contractor) <i>Design of tunnel primary and final support systems and proposal of constructions optimizations (in JV with Prof. Eng. S. Pelizza and with Eng. M. Puccinelli).</i>	
May. 2010 – Sept. 2010	UAE
Independent Consultant	
<b>IMPREGILO - STEP T-02 SEWER PROJECT IN ABU DHABI</b> <i>Review of conventional tunnel design and of work shaft design - Client: COWI S.A. (DK)</i>	
Sept. 2009 – April 2010	Italy
Tunnel Designer	
<b>ANCONA COUNCIL – “Del Risorgimento” Tunnel (L=550m)</b> <i>Verification of the preservation conditions and study of the refurbishment works – Basic Design</i>	
Sept. 2009 – Nov. 2009	Italy
Tunnel consultant	
<b>Tuneles 9 de Julio – Ciudad de Buenos Aires (4 km, including twin-bored 3 lanes tunnels)</b> Geotechnical Consultancy for the revision of basic design of tunnel Client: S.E.A. Consulting S.r.l. for TORNO Global Contracting S.p.A. <i>Design of tunnels support system, subsidence analyses and evaluation of effects on existing buildings.</i>	
May 2009 – in progress	Italy
Design Engineer	

**ANAS (Italian Road Authority) - Salerno–Reggio Calabria Motorway, Lot DG 39/04 (L=18 km) - PIZZAROTTI & C. (General Contractor)**

Client: STUDIO TECNICO ING. PUCCINELLI – Parma for PIZZAROTTI & C. Contractor  
*Construction Design and site follow up of underground works (n.3 twin-tube tunnels + n.1 single-tube tunnel, total length 3300 m)*

**DMS G.E. S.R.L. ([WWW.DMSG.E.IT](http://WWW.DMSG.E.IT)), ROME (2007→ 2009):**

Sept. 2008 – Oct. 2009	Italy/Ethiopia
Risk consultant	
<b>Beles Multi Purpose Project</b> (includes headrace tunnel L=12km, tailrace tunnel L=7 km, excavated with n.2 double shield TBMs in open mode) <b>Gilgel Gibe II Hydropower Project</b> (includes headrace tunnel L=25km, excavated with n.2 double shield TBMs in open mode) Ethiopia (Salini Costruttori S.p.A.) – Total cost: 430 M€ for each project Client: PROTOS S.p.A., Rome <i>Technical monitoring finalized to the evaluation of insurance risk – Identification of technological, organizational and contractual hazards and risk assessment. Design appraisal report, and site monitoring visits during construction in order to assess risk evolution (n. 3 site visit)</i>	

June. 2008 – Apr. 2009	Italy
Project Manager and Project Engineer for the underground works	
<b>ANAS (Italian Road Authority) - Salerno–Reggio Calabria Motorway, Lot 4a – part II – from km 259+700 to km 286+000.</b> Client: S.T.E. S.r.l., Rome <i>Tunnels final design (n. 10 conventional tunnels)</i>	

Oct. 2007 – Apr. 2009	Italy
Project Manager and Design Engineer	
<b>Restoration of the railway Roma-Civita Castellana-Viterbo.</b> Flaminio station of Roma-Viterbo railway- Total cost: 32 M€ Designer: JV SATPI – DMS G.E. – GP Ingegneria Client: JV CCC – DONATI – SOCOSTRAMO – PRENESTA APPALTI & C. <i>Construction design of station tunnels and related underground structures of Flaminio station</i>	

Sept. 2007 – Mar. 2009	Italy
Project Manager and Design Engineer	
<b>Merchant Harbour of La Spezia</b> Construction Design for the enlargement of Garibaldi Jetty Total cost: 20 M€ Client: CONDOTTE S.p.A. <i>Geotechnical characterization of soils, design of retaining structures for the jetty and site follow up.</i>	

**GEODATA ENGINEERING S.P.A. ([WWW.GEODATA.IT](http://WWW.GEODATA.IT)), TURIN (1998→ 2007)**

2006 – 2007	Italy
Project Manager; Project Engineer for the underground works	
<b>ANAS (Italian Road Authority) - Salerno–Reggio Calabria Motorway, Lot DG 39/04 (L=18 km)</b> – Total cost: 320 M€ Client: PIZZAROTTI & C. (General Contractor) <i>Final design of underground and external works including tunnels, stabilization works, viaducts and bridges, hydraulics.</i>	
2005 – 2007	Italy

Project Manager and Project Engineer	
<b>Circumvesuviana Railway</b> Line Naples – Torre Annunziata – Poggiomarino Concession for doubling the existing line between Torre Annunziata and Pompei Client: PIZZAROTTI & C. <i>Tunnel Boscoreale – Boscotrecase, left tube. Detailed design.</i>	
2005 – 2007	Italy
Project Manager and Project Engineer	
<b>Circumvesuviana Railway</b> Line Torre Annunziata – Castellamare, Section Pioppaino – Via Nocera – Castellamare. Client: PIZZAROTTI & C. <i>Castellamare Tunnel, Basic design.</i>	
2005 – 2006	Italy
Project Manager and Project Engineer	
Ministry of Infrastructures - INSTITUTO AUTÓNOMO DE FERROCARRILES DEL ESTRADO (Venezuela National Railways). <b>SISTEMA FERROVIARIO CENTRAL, Section Puerto Cabello – La Encrucijada</b> Client: IMPREGILO VENEZUELA <i>Barbula Tunnel, section in alluvial soil (L=500m) - Total cost: 20 M€</i> <i>Conceptual and final design.</i>	
2004 – 2007	Italy
Project Manager and Project Engineer	
RETE FERROVIARIA ITALIANA S.p.A. - Zona territoriale nord ovest - Direzione compartimentale infrastruttura di Milano <b>Redouble of Carnate Usmate – Airuno railway stretch</b> Client: TODINI Costruzioni S.p.A. <i>Construction Design of Beverate (L=2200m) and Roncaglia (L=330m) tunnels, and construction follow-up - Total cost: 32 M€</i>	
Dec. 2003 – 2006	Italy
Project Manager and Project Engineer	
ARES PIEMONTE (Regional Agency for Road of Piemonte Region) - <b>Omegna ring road (L=2800m)</b> <i>Basic Design, Detailed Design and Final Design. The project includes the Boccio Tunnel, L=1300m – Total cost: 45 M€.</i>	
Dec. 2003 – Oct. 2004	Italy
Project Engineer	
Client: RIZZANI DE ECCHER S.P.A., for the government of Albania, Ministry of Transport and Telecommunications, Department of roads <b>Durres-Morine Connection - Rreshen – Kolshi Corridor</b> <i>Conceptual design of the 5km-long "base" tunnel (from Thirra to Kalimash) and of other short tunnels.</i> (JV: Tecnic – Geodata – Infratransproiect)	
2003 – 2005	Italy
Project Engineer	
EGNATIA ODOS A.E. – EGNATIA ODOS Highway Section Panagia-Grevena (sections 4.1.1, 4.1.2, 4.1.3) of Egnatia Odos <b>Twin-tube tunnels Syrtos &amp; Ag. Triada (section 4.1.1s)</b> <i>Final design</i>	
2003	Italy
Project Engineer	

<b>TRIESTE COUNCIL – GRANDE VIABILITÀ TRIESTINA (Trieste Ring-Road)</b> <i>Construction Design of the Cattinara Tunnel: consultancy to the Client for check and verification of Contractor design proposal.</i>	
2003	Italy
Project Engineer EGNATIA ODOS A.E. – EGNATIA ODOS Highway <b>Twin-tube Driskos Tunnel</b> <i>Construction Design in high deformation conditions</i>	
2002-2003	Italy
Senior Engineer OLYMPIC GAMES 2006 TURIN AGENCY (AGENZIA TORINO 2006) <b>National Road n°23 “del Sestriere” – Porte ring-road</b> <i>Final design (including Craviale and La Turina Tunnels, L=1000m and L=600m respectively)</i>	
Nov. 2001- Nov. 2002	Portugal
Senior Engineer - Geotechnical design and trench construction follow-up <b>METRO DO PORTO – Porto Light Metro Project - Lines C, S</b> <i>Development of the Construction Design for the 3 access trenches, including monitoring design and mitigation measures.</i> <i>On-site designer representative during Trindade trench construction.</i> <i>Construction follow-up of consolidation works including compensation grouting in a densely populated low-cover area.</i> (JV Geodata-Mott MacDonald)	
2000 – 2001	Italy
Junior Engineer <b>ANAS – Asti-Cuneo Motorway Commissionership</b> – Lot 1.3 (S. Albano Tunnel) and Lot 2.8 (Roreto Tunnel) – <i>Final Design</i>	
2001 – 2004	Italy
Junior Engineer CRAVAGLIANA MUNICIPALITY. Ferrera - Valbella Council Road. <b>Cravagliana Tunnel</b> - <i>Basic, Final and Construction Design</i>	
2001	Italy
Junior Engineer MINISTERIO DE TRANSPORTE Y COMUNICACIONES – VENEZUELA – Central Railway System, Caracas – Tuy Medio section - Consorcio Contuy Medio Grupo A (CCMA) - <b>Las Mayas Tunnel</b> (L=570m) – <i>Construction Design</i>	
2000	Italy
Junior Engineer ANAS - State Road SSN°355 “DELLA VAL DEGANO” – Tors by-pass – Bridge on the Degano river – <b>Validation of the foundation works</b> Vidoni S.p.A – <i>Construction Design.</i>	
2000	Italy
Junior Engineer LA FERROVIARIA ITALIANA - Arezzo-Sinalunga railway line – <b>Castellina Tunnel</b> – Study of the lining refurbishment works – <i>Basic Design.</i>	
2000	Italy
Junior Engineer FF.SS. – Torino-Modane railway line – <b>Frejus railway tunnel</b> - Study of the lining refurbishment works – <i>Basic Design.</i>	

2000	Italy
Junior Engineer	
MINISTERIO DE TRANSPORTE Y COMUNICACIONES – VENEZUELA – Central Railway System, Caracas - Tuy Medio section - Consorcio Contuy Medio Grupo A (CCMA) – <b>Mume Tunnel</b> (L=200m) – <i>Construction Design</i>	
1999	Italy-Venezuela
Junior Engineer and Designer's representative on site	
MINISTERIO DE TRANSPORTE Y COMUNICACIONES – VENEZUELA – Central Railway System, Caracas - Tuy Medio section - Consorcio Contuy Medio (CCM): <b>Tazon Tunnel</b> (L=6405m) - <i>Construction Design</i> <b>Canoas 1 Tunnel</b> (L=1220m) - <i>Basic Design</i> <b>Pitahaya Tunnel</b> (L=580m) - <i>Construction Design</i> <i>Technical assistance on site</i> (Caracas, Venezuela) for the risk analysis and design update during construction (August – December 1999).	
1999	Croatia
Junior Engineer	
ZAGREB-GORICA MOTORWAY – CROAZIA (1999) – <b>Hrastovec &amp; Vrtlinovec Tunnels</b> - <i>Final Design.</i>	
1999	Italy
Junior Engineer	
TEHERAN CHALOUS FREEWAY - IRAN - <b>Taloon and Kandovan exploratory tunnels</b> - <i>Conceptual Design.</i>	
1998	Italy
Junior Engineer	
ATS - Torino Savona Motorway - Lot 16, Priero-Altare Section – <b>Retaining wall San Sebastiano South viaduct</b> – <i>Construction Design</i> - CoopSette S.p.A.	
1998	Italy
Junior Engineer	
ANCONA COUNCIL – Ancona town reconstruction – <b>San Martino Tunnel</b> (L=550m) - <i>Final Design.</i>	

## PUBLICATIONS

- M. Puccinelli , **N. Avagnina**, G. Cerchiaro, F. Ballabeni: "An effective application of observational method in weak-rock tunnelling" – WTC 2011, Helsinki
- A. Eusebio, P. Grasso, S. Cocchi, **N. Avagnina**: "National Road n°23 "del Sestriere" – Porte ring-road – From design to test" - LE STRADE 9/2006
- E. Chiriotti, **N. Avagnina**, P. Grasso, G. Tripoli: "Compensation grouting for safe TBM tunnelling beneath low-cover" - 5th International Symposium on Geotechnical Aspects of Underground Construction in Soft Ground - Amsterdam 2005
- P. Grasso, S. Xu, M. Pescara, **N. Avagnina**: "The design challenges of a soft-ground twin-bore tunnel on a connection motorway in NW Italy" - 2003 RETC (Rapid Excavation Tunnelling Conference) – New Orleans, 15-18 June 2003.