



CURRICULUM VITAE DANIELE BATTAGLIA
Structural and Engineering Geologist



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FIELDS OF EXPERTISE

- Engineering Geology, Rock and Soil Mechanics
- Geological, geomorphological and hydrogeological studies
- Geotechnical characterization of soils and rock masses
- 3D geological modeling
- Geological and geotechnical expert for hydropower plants and tunnels
- Ground Risk evaluation for civil engineering and environmental projects
- Planning, management and supervision of site investigations and monitoring.
- Photointerpretation, GIS, remote sensing and historical site reconstruction
- Close range and aerial photogrammetry with UAV

QUALIFICATIONS

- Chartered Italian Geologist and Principal of Studio Georisk
- Member of the International Society of Rock Mechanics (ISRM), International Association of Engineering Geologists (IAEG) and Italian Geotechnical Association (AGI)
- 2007-2009 Adjunct Professor of 3D Geological Modeling at the University of Studies of Milan
- 2001-2005 Counselor and Treasurer of the Lombardia Board of Geologists

EDUCATION

- Master of Science in Engineering Geology, (September 1995)
Royal School of Mines: Imperial College of Science, Technology and Medicine - London, England.
Dissertation: The Gurzia Dam, Italy. Site Investigation and Foundations Stability Analysis.
Academic Honors: Distinction and Lapworth Medal Award.
- Laurea Degree (MS equivalent) in Structural Geology, (March 1993).
Universita' degli Studi - Milan, Italy.
Dissertation: Structural study of metamorphic complexes in Belviso and Campovecchio Valleys, Italy".
Academic Honors: Graduated Summa cum Laude.
- Extended studies:
 - Course on Safety measures for works at height and on rope (April 2016), Trentino Alpine Guides
 - Course for Unmanned Aerial Vehicles pilot licence (February 2016), Geoskylab
 - Course on Reservoir Geomechanics (April-May 2014), Stanford University on line course
 - Course on Seismic Geotechnics (October 2012), CISM Udine
 - Course on Advanced method for the remediation of contaminated sites (May 2009), Province of Milan
 - Course on SAR Satellite Interferometry for monitoring ground movements (July 2007), TRE-Europa, Milano
 - Course on Avalanche dynamics, (June 2005), SUPSI (Professional University of Switzerland), Lugano, CH
 - Course on Foundation Geotechnics, (June 2004) University of Pavia - Lombardia Board of Geologists
 - Course on Debris Flows (May-June 2003), SUPSI (Professional University of Switzerland), Lugano, CH
 - Course on Rock Anchors (October 2002), ANAS (Italian Road and Highway Agency)
 - Course on Bio-engineering for soil conservation (March 2001), Regional School on Bio-engineering
 - Course on Polluted Sites: investigation and remediation (June 2000), Politecnico of Milano
 - Course on Pumping Tests (January 2000), Lombardia Board of Geologists
 - Course on Finite Elements Principles and Practice (April - June 1998), University of California at San Diego.
 - Course on Mechanical Tunneling, Raise Boring and Shaft Drilling (February 1998), Colorado School of Mines
 - Course on Slope stability analysis in soils (June 1997), Lombardia Board of Geologists
 - Course on Concrete in aggressive environment (November 1996) ATE
 - Course on Regulations in engineering geology practice (November 1995), Lombardia Board of Geologists
 - Course on Snow and Avalanches (November 1991), Regione Lombardia.

COMPUTER SKILLS

- MS Office, CAD and GIS software
- Geodatabase and 3D geological modelling
- Geotechnical software



LANGUAGES

- Italian: native
- English: fluent reading, speaking and writing
- Spanish: fluent reading, speaking and writing

PROFESSIONAL EXPERIENCE

Full projects map and geodatabase available [HERE](#)

- **January 2000 to present**
PRINCIPAL OF STUDIO GEORISK
 Major projects:

DAMS AND HYDROELECTRIC POWER PLANTS

2017	Honduras	El Tablon Hydroelectric Project (40MW) Review of geological-geotechnical model for construction bidding	Lombardi
2016-2017	Perù	Ayanunga Hydroelectric Project (20MW) Geological survey, site investigation plan and geotechnical characterization for basic design	Lombardi
2016	Honduras	Arenal IV Hydroelectric Project (50MW) Preliminary geological study for Due Diligence	Lombardi
2016	Uganda	Sisi and Cresta Hydroelectric Project (10 and 8MW) Geological assessment and site investigation plan for design bidding	Zollet
2016	Perù	Zana II Hydroelectric Project (8MW) Geological mapping and study for Feasibility design	Lombardi
2015	Cameroun	Grand Eweng Hydroelectric Project (1200MW) Site visit and geological assessment for design bidding	Lombardi
2015	Ecuador	Alambi-Tulipe Hydroelectric Project (10MW) Geological and geotechnical assessment for Feasibility design	Lombardi
2015-2017	Honduras	Arenal I and II Hydroelectric Project (50MW) Geological mapping and site investigation plan	Lombardi
2015	Perù	Santa Lorenza I and II Hydroelectric Project (18 and 8MW) Geological and geotechnical study for Feasibility design	Lombardi
2015	Zambia	Kafue Gorge Small Hydropower Station (10MW) Geological and geotechnical study for Feasibility design and site selection	Zollet - Gopa
2014-2016	Ecuador	Santiago G8 Hydroelectric Project (3600MW) Review and validation of the geological investigations and model	Lombardi
2014	Guatemala	La Campana Hydroelectric Project (60MW) Geotechnical study for Feasibility design and selection of tunnel alignment	Solel Boneh
2014	Honduras	Jacaleapa Hydroelectric Project (15MW) Site visit, aerial photogrammetry and site investigation plan	Lombardi
2014	Bulgaria	Neikovtsi Dam (Water storage) Geological survey, site investigation plan, geological - hydrogeological model and geotechnical characterization	Stucky
2013	Guatemala	Santa Maria de Jesus Dam (25MW) Geological survey and risk assessment for dam security analysis	Lombardi
2013	Ecuador	San Vicente Dam (Water storage) Geotechnical advice for spillway instabilities due to degradable claystones	Odebercht
2013-2014	Guatemala	El Volcan Hydroelectric Project - Dam site (26MW) Geological study for dam site selection, photogrammetric survey	Lombardi
2012-2015	Honduras	Santa Maria de Quipúa Dam (40MW) Geological and photogrammetric survey, speleological exploration, geological model, site investigation plan, geotechnical assessment	Lombardi

2012	Honduras	Ojo de Agua Hydroelectric Project (20MW) Geological expertize during construction	Lombardi
2011-2015	Ethiopia	Great Ethiopian Reinassance Dam - Main Dam e Spillway (6000MW) Geostructural and photogrammetric surveys, geological and hydrogeological model, geotechnical assessment	Studio Pietrangeli
2010	Ecuador	Chespì - Palma Real Hydroelectric Project (450MW) Geostructural survey, dilatometr test, borehole optical survey, geotechnical assessment, paleoseismological study of the Nanegalito Fault.	Asociacion LPC
2010	Italia	Ca Selva Dam (10MW) Geostructural survey and wedges stability analysis	Edison
2009	Sierra Leone	Yiben Hydroelectric Project (66MW) Site Investigation Plan	Studio Pietrangeli
2007	Ethiopia	Gibe II Dam (420MW) Geotechnical model review, geological risk analysis for insurance	DMS
2007	Ethiopia	Gibe III Dam (1870MW) Geotechnical assessment of the dam foundations	Studio Pietrangeli
2007-2012	Italia	Somplago Hydroelectric Plant (166MW) Site investigations, geological and hydrogeological model, geotechnical assessment, hydrogeological monitoring	Edipower
2006	Ethiopia	Beles MPP Project (450MW) Hydrogeological model and geotechnical assessment	Studio Pietrangeli
2006	Sierra Leone	Bumbuna Dam (50MW) Fluorescent tracer test for detection of dam leakages	Salini Costruttori
2005	Italia	Bomba Hydroelectric plant (58MW) Geotechnical study of the dam foundation	Azzoni
2001	Italia	Scais Hydroelectric plant (22MW) Geological study for instabilities along the headrace canal	Enel.Hydro
2000	Italia	Ceppo Morelli Dam (22MW) Geostructural survey of the dam abutments	Edison
TUNNELS			
2016	Armenia	Sisian – Kadjaran Highway Base Tunnel Field mapping, 3D geological model, geotechnical characterization	SPEA
2015	Perù	Carretera Interoceanica Perù – Brasil – Tunel km 240 Geological and geotechnical study	Lombardi
2013-2015	Ecuador	Quijos Hydroelectric Project - Papallacta, Quijos and Principal Tunnels Review of the geological model, geotechnical assessment, risk analysis	Astec Integral
2013	Italia	Morbegno Tunnels - National Route 38 Geological and geotechnical assessment for construction bidding	Strabag
2012	Ecuador	Pucarà Hydroelectric Plant - Headrace Tunnel Remediation Geological model, geotechnical assessment, on site geologist for construction management	Lombardi
2011-2015	Italia	Kiens Tunnel - National route 49 Geological and hydrogeological model, geotechnical assessment	Provincia di Bolzano
2011	Panama	Esti Hydroelectric Plant - Headrace Tunnel Remediation Geological and geotechnical assessment for swelling rocks	Lombardi
2007-2012	Italia	Somplago Hydroelectric Plant - Phase 2 Headrace Tunnel Geological and hydrogeological model, geotechnical assessment	Edipower
2007	Italia	Monte Trattunale Railway Tunnel Geological and hydrogeological model, geotechnical assessment	AK Ingegneria

2006	Italia	Genoa Gronda Project - Section Vesima Val Varenna Geological and hydrogeological model, springs survey, geostructural survey, feasibility study for TBM excavation	SPEA
2002	Italia	Passo della Morte Tunnel - National route 52 Geological model and landslide analysis	Vidoni
2002	Italia	Sellero, Capodiponte e Berzo Demo Tunnels - National route 42 Geological and geotechnical assessment	Soil
2000	Italia	Bema Tunnel - Morbegno Geological and geotechnical assessment	Regione Lombardia

HIGHWAYS

2016	Armenia	Sisian – Kadjaran Highway Field mapping, geological and geotechnical characterization	SPEA
2015	Perù	Carretera Interoceánica Perú Brasil - Llocclamayo landslide bypass bridges Geological mapping, site investigation management, debris flow risk assessment	Lombardi Perù
2013-2014	Italia	Torino - Savona Highway Geological and geotechnical studies for technological installations	SINA
2009-2013	Italia	Cisa Highway Geological and geotechnical studies for technological installations	SINA
2010	Italia	Asti - Cuneo Highway Geological and geotechnical studies for tollgates and technological installations	SINA
2010	Italia	Broni - Mortara Highway Geological, geomorphological and hydrogeological study	A&T Consulting
2009	Italia	Torino - Milano Highway Geological and geotechnical studies for technological installations	SINA
2009	Italia	Pedemontana Veneta Geomorphological survey, geological and hydrogeological model	AK Ingegneria
2007	Italia	Macrolotto 2 - Salerno Reggio Calabria Highway Geological model, geomorphological analysis, geotechnical assessment	SIS
2005-2006	Italia	RAV - Valle d'Aosta Highway Geological and geotechnical studies for secondary roads	SINA

LANDSLIDES AND SLOPE STABILITY

2013	Italia	Rividulano site – Corniglio (PR) Geostructural survey and rockfall analysis	Studio Puccinelli
2009	Italia	Monno - Valvedello road - Piateda (SO) Rockfall risk analysis and preliminary design of the remediation measures	Edison
2008	Sierra Leone	Bumbuna Dam Geomorphological survey, Landslide hazard and risk analysis	Studio Pietrangeli
2008	Italia	Avigliana landslide - Avigliana (TO) Expert witness for legal dispute	Musinet
2007	Italia	Macrolotto 2 - Salerno Reggio Calabria Highway landslides Geomorphological study and slope stability analysis	AK Ingegneria
2004-2009	Italia	Val Orsara landslides - Fusine (SO) Geological - geotechnical study	Provincia di Sondrio
2003	Italia	Bedolessa landslide - Colico (LC) Geological - geotechnical study	Colico

2002	Italia	Naquane landslide - Capodiponte (BS) Geostructural survey and rockfall analysis	Soil
2001-2013	Italia	Valpola landslide - Valdisotto (SO) Site investigations construction management and inclinometers monitoring	Regione Lombardia
2001	Italia	Scais Hydroelectric plant - Piateda (SO) Geological study for instabilities along the headrace canal	Enel.Hydro
ENVIRONMENTAL			
2015	Italia	Illegal landfills identification Historical reconstruction of regional quarry and landfill activities from aerial photos and satellite images	ASM Pavia
2011-2013	Italia	Remediation of the ex area Falck - Sesto San Giovanni (MI) Historical reconstruction from aerial photos and detection of World War II bombed areas	Globo Service
2013	Italia	Somplago Hydroelectric Plant Environmental study for the disposal of sludge produced by TBM-EPB	Edipower
2004-2010	Italia	Remediation of the ex area Sasatex - Biassono (MB) Site assessment, remediation design and construction management	Immobiliare Elisa
2009	Italia	Remediation of the ex area Colussi - Montebello della Battaglia (PA) Historical reconstruction from aerial photos	Globo Service
2007	Italia	Remediation of the Baccu Locci mine - Villapuzzu (CA) Geological and geotechnical model	Montana
2004	Italia	Refurbishment of 25 AGIP ENI petrol stations - Various municipality Environmental investigations for plant refurbishment	ENSR
2004	Italia	Remediation of the ABC Farmaceutica - Trecate (NO) Historical reconstruction from aerial photos	ENSR
2003	Italia	Remediation of the ex area Fluosit - Asola (MN) Historical reconstruction from aerial photos	Globo Service
2002	Italia	Benago Quarry Landfill - Sedrina (BG) Feasibility study for a sanitary landfill	GTA srl

• **December 1998 to December 1999**

Company: **GEODATA Spa**, Turin, Italy

Position: SENIOR ENGINEERING GEOLOGIST

Projects:

- Tazon and Pitahaya Tunnels, Venezuela: On site Tunnel Design Representative
- Harstovec and Vrtlinovec Tunnel, Croatia: hydrogeological impact evaluation
- Val Vigezzo Road, Italy: risk analysis for landslides and rock fall
- Sorenberg Tunnel, Switzerland: ground condition evaluation for TBM design
- Autostrada Salerno-Reggio Calabria, Italy: geological and geotechnical study of Renazza and Monte Sirino tunnels
- Kandovan and Taloon Tunnels, Iran: geotechnical characterization
- Egnatia Odos, Greece: geological and geotechnical audit of $\Sigma 2$, $\Sigma 3$ e $\Sigma 4$ Tunnels

• **November 1997 to November 1998**

Company: **BECHTEL Inc., OWENS Geotechnical Inc. and Costal Consultant Inc.**

Position: SENIOR ENGINEERING GEOLOGIST

Projects:

- Arrowhead Tunnels, San Bernardino CA - USA: temporary site geologist
- Point Vicente Park Extension, Rancho Palos Verdes CA- USA: site investigations for building expansion
- US Fishery Buildings, La Jolla CA - USA: site investigations for cliff stability



- **January 1996 to November 1997**

Company: **ROCKSOIL Spa** of Prof. Ing. P. Lunardi, Milan, Italy

Position: **ENGINEERING GEOLOGIST, HEAD OF THE GEOLOGICAL OFFICE**

Projects:

- Naples subway Line 1 (Dante - Garibaldi): SI plan, geological model and geotechnical characterization
- Montenero Tunnel: assessment of consolidation grouting efficiency
- Marinasco Tunnel: SI plan, geological model and geotechnical characterization
- Nobiallo Tunnel: geological and geotechnical characterization, surveys during construction
- Barghe Tunnel: geotechnical surveys during construction and tunnel excavation classification
- Ronchi Tunnel: geotechnical surveys during construction and tunnel excavation classification
- Monte Covolo Tunnel: geotechnical surveys during construction and tunnel excavation classification
- S. Silvestro e Le Piane Tunnels: SI plan, geological model and geotechnical characterization
- Serena Tunnel: support to construction tender
- Pieve Vergonte hydraulic Tunnel: evaluation of the expected TBM advance rate for construction tender
- Val Viola hydraulic Tunnel: evaluation of the expected TBM advance rate for construction tender
- Bologna – Firenze high-speed railway link: rock slope stabilization design for adits portals
- Vasto Tunnel: geological support during construction, analysis of tunnel failure
- Sanremo underground station: SI plan, geological model and geotechnical characterization
- Tartaiguille Tunnel (France): study of the swelling behavior of the rock mass

- **July 1994 to December 1995**

Company: **ISMES** (Research Institute of the Italian Energy Agency).

Position: **JUNIOR GEOLOGIST**

Projects:

- Bologna-Florence high-speed railway link: in situ and laboratory rock mechanics characterization.
- Val Artogna Hydroelectric project: engineering geological mapping
- Gurzia Dam: site investigation and foundation stability assessment
- Valla Dam: 1994 flood damage assessment
- Research on the geomechanical and geophysical properties of rock and concrete laboratory samples

PUBLICATIONS

- Battaglia D., Bezzi A., Birindelli F., Rinaldi M., Vettrano E.: *Fluorescent Tracer Tests for detection of dam leakages: the case of the Bumbuna Dam - Sierra Leone*; Engineering Geology, vol. 205 (2016) pg 30-39
- Battaglia D., Strozzi T., Bezzi A.: *Landslide hazard - risk zonation and impact wave analysis at the Bumbuna reservoir – Sierra Leone*; IAEG XII Congress 2014
- Battaglia D., Bezzi A.: *Fluorescent tracers tests for localization of dam leakage zones: the remediation of the Bumbuna Dam – Sierra Leone*; Act ICOLD Symposium 2013
- Francani V., Piccin A., Berra F., Battaglia D., Gattinoni P., Rigamonti I., Rosselli S.; *Carta geologica d'Italia 1:50.000 – Foglio 118 Milano* e relative Note Illustrative
- Battaglia D.; *Ricostruzione storica di siti contaminati attraverso l'analisi di fotografie aeree e carte storiche*; Rivista Siti Contaminati, Febbraio 2004
- Battaglia D.; *Geologi Lombardi, risultato di un'inchiesta dell'Ordine dei Geologi della Lombardia*; Professione Geologo n.16, Marzo 2003
- Battaglia D.; *Polizza sulle catastrofi naturali, aspetti tecnico operativi*; Bollettino della Associazione Italiana Periti Assicurativi, Gennaio 2002 e sulla rivista Assinews Giugno 2002
- Battaglia D.; *Tecniche di indagine, caratterizzazione geotecnica e geomeccanica e classificazioni di rocce e terreni. Applicazioni a problematiche geo-ambientali*; Atti del corso in Tecnologie e Tecniche di Misura in campo geo-ambientale, Associazione Italiana Strumentisti, Febbraio 2000.
- Spalla M.I., Carminati E., Ceriani S., Oliva A., Battaglia D.; *Influence of deformation partitioning and metamorphic equilibration on P-T path reconstruction in the pre-Alpine basement of the Central Southern Alps*; Journal of Metamorphic Geology, n. 3, May 1999.
- Carminati E., Siletto G. B., Battaglia D.; *Thrust kinematics and internal deformation in basement involved folded thrust belts: the Eastern Orobic Alps case*; Tectonics, vol.16, #2, pag. 256-271, April 1997
- Albini S., Battaglia D. et al.; *Alpine deformation and prealpine remnants in the north eastern Orobic Alps, Southalpine basement*; Quaderni di Geodinamica Alpina e Quaternaria, II, 25-39, 1994

Peer reviewer for the Engineering Geology Journal (Elsevier)