

Augusto Lucarelli

Principal Engineer

Expertise

Soil mechanics, numerical modeling of geotechnical processes, shallow and deep foundation design, soil improvement, slope stability, mechanized excavation, conventional tunneling in urban areas, deep excavation and support structures in difficult environments. Numerical software literacy in *FLAC2D*, *FLAC3D*, *UDEC*, *Plaxis2D*, *Plaxis3D foundations*, *Plaxis3D Tunnel*. *Excel* and *Excel VBA* programming.

Education

M.Sc. (Civil Engineering), 1996
Ancona University, Ancona, Italy

Postgrad Master Course in tunneling and Tunnel Boring Machines
(Turin's technical University)

Registration

Registered Professional Civil Engineer, Pesaro-Urbino County (Italy)

Professional Experience

2015 – Present	<i>Itasca Consulting Group, Inc., Minneapolis, Minnesota</i>
2012 – 2015	<i>Principal Civil Engineer</i>
	<i>Senior Civil Engineer</i>
1998 – 2012	<i>Studio Sintesi, Associate:</i>
	<i>Geotechnical Consulting</i>
1996 – 1998	<i>Enereco, S.p.A.</i>
	<i>Staff Geotechnical Engineer</i>
1996 – 1997	<i>Studio Geotecnico Italiano</i>
	<i>Staff Geotechnical Engineer</i>

Project Experience

Liquefaction Risk Mitigation using Jet Grouting Cells — Turkey: Optimization of the jet grouting cell geometry/layout to reduce the liquefaction risk of a sandy deposit in a highly seismic hazard region in Turkey. Trevi Group, 2016.

Fountain Landslide Stabilization — Alberta, Canada: Analysis of different slope improvement alternatives in difficult conditions, performance evaluation. 3D numerical analysis of reticulated micropiles combined with anchors. Geometry and structural optimization. Nicolson Construction, 2016

York Potash Mine Project — 3D numerical model of deep shaft in Halite formation. Calibration of the creep Power constitutive law, including time hardening. Time-dependent analysis of rock support systems over the life span of the support (50 years). ARUP, 2015.

Large Windfarm in China — 3D numerical model of a large diameter driven pile to support offshore wind generator. Static, frequency, and dynamic analysis. Pile length of 100 m, diameter of 6 m, seabed depth of 15 m. Itasca China, 2014.

Landslide Stabilization for Trunk Highway 2, Crookston, Minnesota — MNDOT: Design and build landslide stabilization using slurry shear walls. Create 3D numerical analysis of shear wall interaction in landslide. Use Strength Reduction Method to evaluate the Safety Factor.

Twin Thickener Tanks in Alberta — Canada: 3D numerical model for the simulation of the excavation and back-filling of two large thickener tanks in Alberta, with diameter of 80 m and excavation depth of 15 m. Time-dependent analysis, undrained, consolidation, long-term settlements, and stability evaluation.

Lake Livingston Hydropower Plan — Temporary and Permanent Support System Design: Soil investigation design, 2D and 3D numerical analysis of support system for the intake, penstock, powerhouse and tailrace.

Doha Metro System — Gold Line: 2D numerical analysis with UDEC for the stability evaluation of subway excavation.

Creep Analysis of Salt Caverns in Louisiana: 3D numerical model of deep salt caverns in Louisiana.

Tengizchevroil — Kazakhstan: Geotechnical activity and support to the Piling Study Team.

New Line Subway Line C, Rome — Sections T2, T3, T4, T5, T6a, T7: Soil investigation design, supervision during execution and in-situ and lab testing interpretation. General geotechnical characterization, settlement due to mechanized tunneling and archeological excavation support design (2D FEM analysis).

Numerical analysis of nine underground stations (2D FEM) 22- to 26-m depth, including surrounding soil and support structures stress-strain analysis, bottom excavation stability analysis, seepage analysis, and groundwater controls. Implemented monitoring system design and the observational method application.

Two-dimensional and three-dimensional FEM Modeling of two ventilation shafts (inner diameter of 15 m, excavation depth of 35 m, and 23 m below water level), including support structures and bottom plug design, and hydraulic test. Subway project was completed for Metro C from 2008-2012.

Modernization of the Railway Arcisate — Stabio (Varese): Final design for two conventional railway tunnels in loose granular soil, total length estimated at 3 km, for Salini Construction Company in 2010. Cavity and face support design including jet grouting, fiberglass, fore poling, steel ribs and shotcrete, 2D and 3D FEM analysis. Final lining design.

Highway A14 Cattolica — Senigallia: Final design stage 1 and 2 for SPEA Engineering Company from 2008 to 2009. Construction of the third lane, 15 viaducts, 15 overpasses, cut and cover tunnels, multi-level anchor support structures, embankments and settlements analysis, and slope stability.

Highway A14 Senigallia — Ancona: Final design for massive landslide improvements for SPEA Engineering Company from 2008-2009. The project was related to the risk assessment and corrective measures to improve the stability of a regional landslide that involved Highway A14. The proposed solution involved a drainage system as well as structural shafts. The analysis was carried out with FLAC3D.

Permanent Safety Setup of the Garbage Disposal (Comune di Manfredonia, Puglia) Final Design: Final design of the bottom and the lateral waterproofing system with grouting treatment and conventional closing cap for the Italian State Commission for Environmental Hazards in 2011.

Strengthening of the Foundations and Structural Repair of the Historical Walls of the Ancient City of M'dina (Malta) Final Design and Works Supervision: Design of the foundations' stabilization works, geotechnical investigations, monitoring plan, tender documents preparation, assistance to the

administration for the works adjudication, technical direction of the works, reception test and acceptance test. 2007-2009.

New IKEA Store — S. Giuliano Milanese: Store's pile foundations design (CFA technology D=600/1000 mm), around 1020 piles of 21 m depth. 2008-2009.

Final Design of 9 Tunnels — Tripoli, Libya: Access ramps and underground technical spaces. Total length 500 m. 2004.

PIR Petrolifera Italo Rumena, Valona – Albania: Geotechnical Consultancy for the reconstruction of an oil terminal in the bay of Valona. Soil investigation supervision. Boreholes and laboratory testing. Soil improvements for oil tanks foundation with diameter 40 m. 2004.

New IKEA Store — Catania: Store's pile foundations design (CFA technology D=600/1000 mm), around 1250 piles of 16/24 m length. 2009-2010.

New Commercial and Business Center in Peschiera Borromeo (Milan): New commercial and business center foundation design. Shallow foundation on improved soil. The soil has been improved by means of concrete columns (CFA D=600/800 mm) with 12/16 m length. Building dimensions are 212 m x 112 m for 10/12 stories.

Alghazala Intercontinental Hotel — Tripoli, Libya: Multi-anchored diaphragm wall structural design (12 m below water level), dewatering system design. TREVIS S.p.A., 2008.

Underground Parking “Novi Sad” Area ex Foro Boario, Modena — Final Design: Consultancy for 2D numerical model for stability analysis, retaining D-walls design and excavation slopes; filtration analysis process for dewatering. Dimensions are 120 m x 100 m, 6 m below g.l., 4 m below w.l.

Underground Parking in Piazza Meda (Milan) and Piazza dei Partigiani, Alassio (SV) — Final Design: Design of the retaining structures. RC D-walls supported by anchors or temporary RC beams, steel beams and slaps; micropiles for supporting bottom slab. Dimensions are 120 m x 40 m, depth of 10 m, GWT 2 m below GL. Design of the dewatering system, monitoring instruments.

Underground Parking in via Manuzio (MI) — Final Design: Design of the retaining structures. RC D-walls, supported by active anchors and passive steel internal strut where it was not possible to realize anchors for external interferences. Dimensions are 85 m x 21 m, five underground floors.

High Speed Railway — Bologna-Florence Section Construction Design: IN15 pk 16+350 -16+500. Laurenziano Landslide. Design of the stabilization works for the high-speed line with 38 RC D-wall panels; dimensions are 6.8 m x 1.2 m, 30-m depth. MAIRE Engineering S.p.A., 2005-2008.

Alternative Route for the SS. 7 Appia (LT) within the Completion of the Coastal Corridor — A.N.A.S. Final Design: Cooperation to the design of the twin tube conventional tunnels (Costamezza 2.7 km - Campese 0.6 km) and of the startups. Slope stabilization for the main tunnel entrances for POLITECNICA S.c.a.r.l., Phase 1: 2003 –2004; Phase 2: 2009 –2010.

International Corridor E78 S.G.C. Grosseto-Fran Upgrade to 4 Lanes on the Section Grosseto-Siena from km 30+040 to km 41+600 — Sections 5, 6, 7, 8. A.N.A.S. Final Design: Cooperation to the design of

the mined tunnels (Casal di Pari 1.6 km – Poggio Terriccio 0.5 km – Greppoli 0.2 km) and of the startups; general geotechnical consultancy and numerical analysis.

Mosul Dam — Iraq: Stability analyses during the excavation of the trench for the construction of 150-m deep cut-off wall. The main concern was to evaluate the behavior of the trench in case of a sudden loss of slurry accidentally happening during the execution of the wall. The analyses were conducted in 3D for the single panel and for the multiple panel configuration. TREVI S.p.A.

New Two-Arches Bridge Crossing the Ticino River along the SS4949 — Vigevano, Italy: Final design of pier foundations (20-m diameter, 20-m deep) for a new bridge over the Ticino River. Later support structure for the excavation has been realized with Continuous Secant Piles (CSP) and the bottom plug with Jet Grouting. Client: Cesi, Contactor: TREVI S.p.A.

Burj Alghatafy Tower (2008) — Business and Commercial Tower (143 x 90, 200 m high) — Tripoli, Libya: Multi-anchored diaphragm wall structural design (18 m below water level), dewatering system design. Osterberg cells load tests back analysis on drilled pile foundation. TREVI S.p.A., 2008-2009.