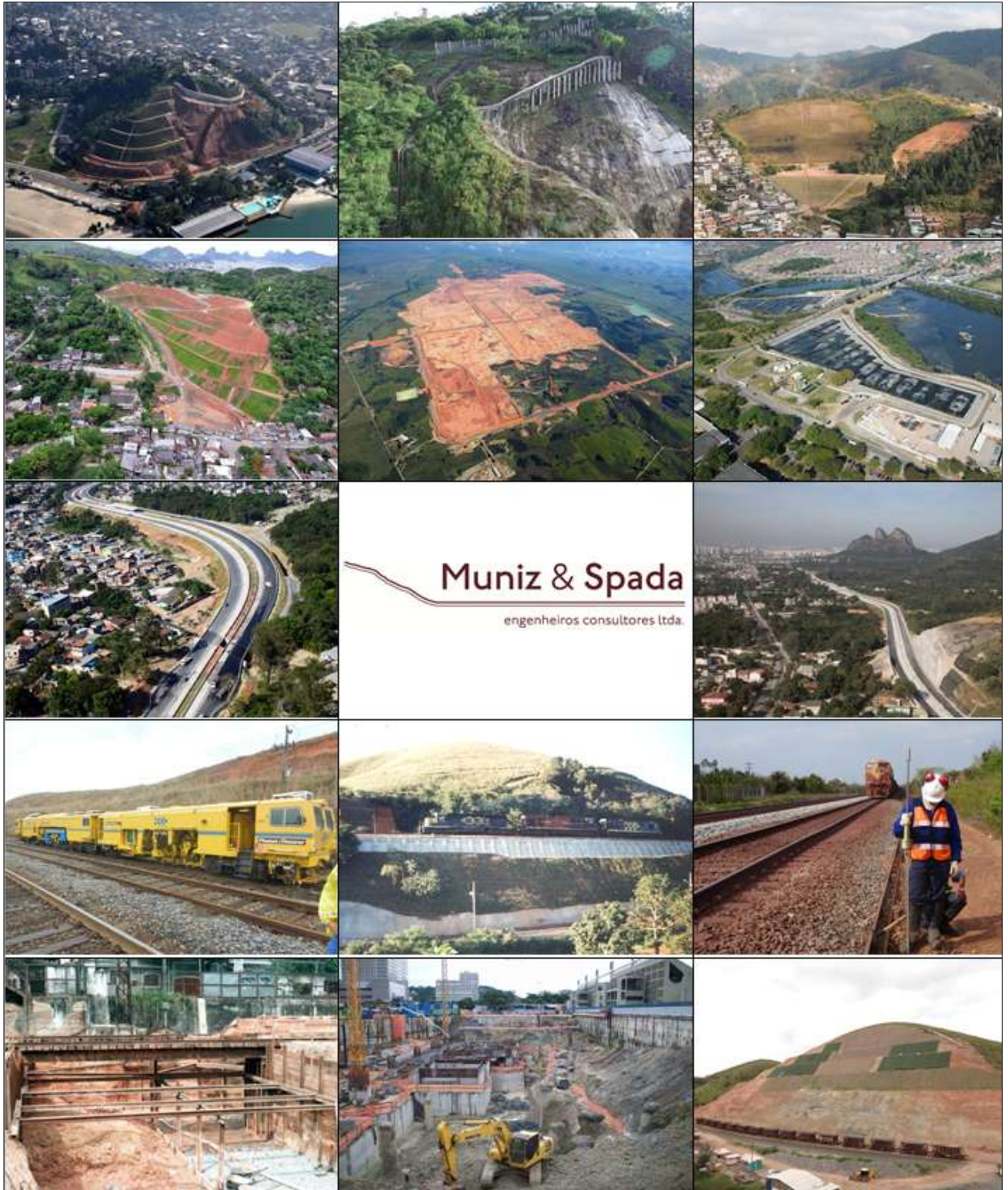


COMPANY PROFILE

2026

Este documento apresenta o currículo empresarial referente à empresa **Muniz & Spada Engenheiros Consultores LTDA.**



COMPANY INFORMATION

Corporate Name: Muniz & Spada Engenheiros Consultores S/C LTDA – EPP

Date of Incorporation: September 20, 1996

CNPJ: 01.471.102/0001-58

Phone: +55 (21) 3553-5069 / 3553-5073 / 98683-2166

Address: Rua Barão de Jaguaripe, 402 – 2nd floor – Ipanema

ZIP Code: 22421-000 – Rio de Janeiro – RJ – Brazil

Site: www.munizspada.com.br

E-mail: munizspada@munizspada.com.br

Technical Directors:

Luiz Francisco Muniz da Silva, CREA RJ 34.834-D

Jorge Luís Goudene Spada, CREA RJ 31.717-D

PRESENTATION

Muniz & Spada Engenheiros Consultores Ltda. is a company established in 1996 to provide consulting, design, studies, project management, and technical supervision services in the field of Geotechnical Engineering and its applications and interfaces. The founding partners have extensive experience in this field, having provided services both in Brazil and internationally.

The company also counts on professionals from other specialties who are incorporated as needed for the development of related activities, such as engineering geology, structural design, topographic surveys, subsurface investigations, hydrological, drainage, and environmental studies.

Muniz & Spada has completed more than 700 projects, studies, and consulting services across more than 90% of the Brazilian territory.



The company has also developed projects in 12 other countries.



AREAS OF EXPERTISE

- Slope stabilization and retaining structures (urban, highway, railway, and industrial areas);
- Excavation support systems;
- Railways – railway geotechnology;
- Foundations;
- Alignment, earthworks, and pavements – transportation systems;
- Disposal of urban, industrial, and mining waste;
- Environmental engineering;
- Drainage and groundwater lowering systems.

CLIENTES



CLIENTS



CLIENTS



SUMMARY OF PARTNERS' CURRICULA

Civil Engineer Luiz Francisco Muniz da Silva, CREA RJ 34.834-D

- Graduated from Universidade Federal Fluminense (1976).
- M.Sc. in Civil Engineering – Geotechnical Area – COPPE (Graduate Program Coordination in Engineering), Universidade Federal do Rio de Janeiro (UFRJ) – Thesis: “*Analysis Methods for Reinforced Soil Retaining Systems with Geotextiles*” (1991).
- Ph.D. in Civil Engineering – Geotechnical Area – COPPE/UFRJ – Thesis: “*Theoretical-Experimental Foundations of Railway Pavement Mechanics and Outline of a Management System Applied to Track Maintenance*” (2002).
- Ranked first in the public examination for Substitute Professor of Highway Engineering II and Traffic Engineering, Transportation Sector, Civil Engineering Department, Universidade Federal Fluminense (December/2003).
- Chairman of Study Commission 23 – Infrastructure – Brazilian Committee 6 – Railway Equipment and Material – Brazilian Association of Technical Standards (ABNT) (1988/1989).
- Professor of **Foundations** for the Civil Engineering course at Fundação Técnico-Educacional Souza Marques – since 1993.
- Elected Board Member of AENFER – Association of Railway Engineers (1992/1994).
- Secretary of the Organizing Committee of the III Brazilian Symposium on Geosynthetics / I South American Symposium on Geosynthetics – Rio de Janeiro (1999).

- Secretary of the Pavement Section of the III Brazilian Symposium on Geosynthetics / I South American Symposium on Geosynthetics – Rio de Janeiro (1999).
- Founder and Coordinator of the Civil Engineering Program and Professor of **Introduction to Civil Engineering** at Sociedade Universitária Redentor – Itaperuna, RJ (2001/2003).
- Professor of **Soil Mechanics** and **Highway Engineering** at Universidade Federal Fluminense (2003/2006).
- Secretary of the Section “*Advances in Rock and Mine Slopes Design*” at the IX International Symposium on Landslides – Rio de Janeiro (2004).
- Professor of the module **Infrastructure and Structures** in the Railway Engineering Graduate Program at PUC Minas (2005).
- Professor of the modules **Railway Pavement Mechanics** and **Railway Track Engineering** in the Railway Freight Transportation Graduate Program at Instituto Militar de Engenharia (IME) for MRS Logística (2005/2006).
- Geotechnical Coordinator in the Extension Project “*Preparation of the Municipal Risk Reduction Plan for the Municipality of Niterói*”, developed through an agreement between UFF and the Municipal Government with Fundação Euclides da Cunha (2005/2006).
- Reviewer of technical papers for conferences and for the journal *Transportes* (ANPET – National Association for Research and Education in Transport), in the railway field.
- Technical Course II – Soil Mechanics – TECNOSOLO S.A. (1978).
- Technical Course III – Soil Testing – TECNOSOLO S.A. (1978).
- Technical Course IV – Design – TECNOSOLO S.A. (1979).

- Concrete Technology Course – TECNOSOLO S.A. (1980).
- Course “*Geotechnical Aspects of Railway Track*” – COPPE – taught by Prof. Ernest Selig (University of Massachusetts, USA) (1989).
- Training Course in Hazardous Freight Railway Transportation – RFFSA (1992).
- Postgraduate Course (Lato Sensu) in Pavement Management Systems – COPPE/UFRJ (1998).
- Course on GPR (Ground Penetrating Radar) Applications in Geotechnics and Environment – Brazilian Association of Engineering Geology – Rio de Janeiro (1999).
- Course “*Application of Geosynthetics in Geotechnics and Environment*” – GEOSSINTÉTICOS'99 – Rio de Janeiro (1999).
- Training internship on operation and maintenance of the LPGMS (Laser Profile and Geometry Measurement System) by E.H. Reeves & Associates, Inc. (EHRA), held from April 26 to May 4, 2001, at GAWES workshops, Tubarão Complex, Companhia Vale do Rio Doce (CVRD), Vitória – ES. The program was part of the modernization contract of the EM-80 Track Recording Car data acquisition and processing system, involving implementation of laser-based track geometry and rail wear measurement technology.
- Basic Course on Interlocking Pavements – Brazilian Portland Cement Association – Rio de Janeiro (2004).
- Engineer at Tecnosolo S.A. (1976–1980).
- Engineer at Geotécnica S.A. (1980–1984).
- Engineer at CBTU (1984–1985).
- Engineer at RFFSA (1985–1995).

- Delivered lectures and published 36 papers in conferences and specialized journals. Supervised 5 undergraduate final projects and participated in Master's and Ph.D. examination committees.
- Winner of the **1998 Academic Production Award** granted by the National Transport Confederation (CNT) for the paper presented at the XII ANPET Congress: "*Qualification and Performance Monitoring of Railway Ballast Using Resilient Deformation Criteria*", published in "*Transporte em Transformação*" – MAKRON Books / CNT (1998).

Partner Engineer at **Muniz & Spada** since 1996.

Civil Engineer Jorge Luís Goudene Spada, CREA RJ 31.717-D

- Graduated from Universidade Gama Filho (1975).
- M.Sc. in Civil Engineering – Soil Mechanics – COPPE/UFRJ – Thesis: "*Filtration Tests in Soils with Geotextiles*" (1991).
- Ph.D. in Civil Engineering – Soil Mechanics – COPPE/UFRJ – Thesis: "*A Pavement Mechanics Approach to Understanding the Stress-Strain Behavior of Railway Tracks*" (2003).
- Professor of **Foundations and Earthworks** at Universidade Gama Filho (2001–2007).
- Professor of **Soil Mechanics I** at Universidade Gama Filho (2002–2007).
- Professor of the modules **Railway Pavement Mechanics** and **Railway Track Engineering** in the Railway Freight Transportation Graduate Program at IME for MRS Logística (2005–2006).
- Instructor for Railway Track Supervisor Training (FCA), organized by CEPEFER (2006).

- Professor of **Railway Pavement Mechanics** module in the Railway Freight Transportation Graduate Program at IME for MRS Logística and Vale (2007).
- Technical Course III – Field and Laboratory Testing – TECNOSOLO S.A. (1977).
- Technical Course V – Design – TECNOSOLO S.A. (1979).
- English Course – Brazil-United States Institute (1967–1969).
- Course on Explosives and Rock Blasting – Dupont do Brasil S.A.
- Course on Geotechnical Aspects of Railway Track – COPPE – taught by Prof. Ernest Selig (University of Massachusetts, USA) (1989).
- Course “*Optimizing Railway Track: Problems, Strategies and Technologies – Plasser & Theurer*” – taught by Prof. Klaus Reissberger (1997).
- Course on Geotechnical Characterization of Slope Movements in the Brazilian Context – COPPE – with Prof. Leroueil (Université Laval, Canada), Prof. Picarelli (University of Naples, Italy), and Prof. Chan (Hong Kong Geotechnical Engineering Office) (1998).
- Engineer at ECOPLAN S.A. (1976).
- Engineer at Tecnosolo S.A. (1977–1979).
- Engineer at ENGEFER (1979–1984).
- Engineer at RFFSA (1984–1995).
- Delivered lectures and published 22 papers in conferences and specialized journals. Participated in Master's thesis committees.
- Winner of the **1998 Academic Production Award** (CNT) for the paper presented at the XII ANPET Congress: “*Qualification and Performance Monitoring of Railway Ballast Using Resilient Deformation Criteria*”, published in “*Transporte em Transformação*” – MAKRON Books / CNT (1998).

Partner Engineer at **Muniz & Spada** since 1996.

MAIN STUDIES AND PROJECTS

1. Slope Stabilization and Retaining Structures

- Design and technical supervision of the execution of a tieback retaining wall at Estrada do Contorno 2,500, Angra dos Reis (RJ).
- Projects for stabilization of embankments at km 341+520 and 362+650, Uvaranas–Pinhalzinho section, Southern Main Trunk Railway, Paraná, for Ferrovias Sul Atlântico S.A. – 1997.
- Soil nailing retaining structure design for a cut slope located behind the property at Rua Franklin de Moraes 119, Barra do Piraí (RJ), for Unibanco Seguros S.A. – 1997.
- Detailed design and technical supervision of anchored retaining wall and rehabilitation of masonry retaining structure at Av. do Contorno, 2500, Angra dos Reis (RJ), for Contemat Engenharia e Geotecnia S.A. – 1998.
- Technical report on slope instability at the maneuvering yard and parking area for transmission towers, located at Estrada do Sumaré, for Contemat Engenharia e Geotecnia S.A. / TV Globo – 1998.
- Technical opinion regarding foundation failure of Tank F-238 during construction at Refinaria de Petróleo de Manguinhos S.A., Avenida Brasil 3141, Rio de Janeiro (RJ) – 1998.
- Retaining structure projects at Blue Tree Park Resort – TANGUÁ Hotel Complex, Angra dos Reis (RJ), for Contemat Engenharia e Geotecnia S.A. / Construtora AKYO / FUNCEF. Scope included geological-geotechnical mapping and risk mapping, slope stabilization using anchored walls (total area of 4,540 m²), instrumentation design and behavior analysis based on monitoring data – 1998 to 2001.
- Excavation support design for construction of a gallery beneath the railway line at Ricardo de Albuquerque Station (RJ), for Estacon Engenharia S.A. – 1999/2000.

- Retaining wall over railway tracks anchored with deadman beams, replacing a failed gravity wall, Granja Santa Lúcia Condominium, Itaipava (RJ) – 1999/2000.
- Technical opinion on slope stability – Ponta do Camorim Condominium, BR-101 (Rio-Santos Highway), km 88, Angra dos Reis (RJ) – 1999/2000.
- Retaining structure projects for multiple communities under the Favela-Bairro Program, Rio de Janeiro City Hall – 2000 to 2002.
- Soil nailing retaining structure design for the freight branch cut slope – Tip-Timbi section, METROREC expansion – 2000.
- Slope stabilization project using tieback walls, reinforced concrete L-shaped walls with anchors, soil nailing, and root piles, Volta Redonda (RJ) – 1999/2000.
- Stabilization of Rio Bengala riverbanks using gabion walls, Friburgo (RJ), for Contesa Engenharia – 2000.
- Retaining projects for railway sections on Linha do Centro, km 108+750 and 337+680 – 2000.
- Retaining project for highway section at Estrada de Araras, km 6, Petrópolis (RJ) – 2000.
- Tieback retaining wall design for access road to upper Granja Comary (CBF), Teresópolis (RJ) – 2000.
- Geotechnical diagnosis and intervention plan for Vila Nova Sepetiba community – Morar Legal Program – 2000/2001.
- Analysis of reinforced embankment projects for Pinheiros and Imbiribeira stations (Metrorec) – 2001.
- Analysis of slope stabilization and foundation projects for Metrorec South Line (Lots 1 and 2) – 2001.
- Stabilization of Rio Bengala riverbanks using gabion walls – 2001.
- Erosion recovery and consolidation project for railway cut at km 222, MRS main line – 2001.
- Stabilization of toll plaza slopes along BR-040 (Rio-Juiz de Fora) – 2002.
- Slope stabilization of railway embankments in multiple sections of MRS railway lines – 2002.

- Landslide recovery project using manual earthworks and deep horizontal drains, Comary, Teresópolis (RJ).
- Retaining structures and construction supervision for residential development in Laranjeiras (RJ) – 2001/2002.
- Inspection report and technical supervision of corrective measures for slope and retaining structures in Laranjeiras (RJ) – 2001/2002.
- Consultancy, construction supervision, and retaining projects using pile-supported walls, soil-cement walls, soil nailing, and foundations, Teresópolis (RJ) – 2002 to 2005.
- Tieback retaining wall project at km 424+780, César de Souza – São Silvestre railway branch – 2002.
- Retaining structures combining tieback walls and reinforced concrete/gravity walls for residential development in Angra dos Reis (RJ) – 2003.
- Consultancy for retaining works and pullout tests at Angra II Nuclear Plant (RJ) – 2003.
- Tieback retaining wall design – Condomínio Caçãõ, Mangaratiba (RJ) – 2003.
- Soil-cement retaining wall design for residential development in Lagoa (RJ) – 2003.
- Studies and diagnostics for unstable cut slopes along North-South Railway (VALEC) – 2005.
- Executive stabilization projects for Casabito–Constanza Highway (Dominican Republic) – 2005 to 2008.
- Slope stabilization design at Angra 1 Nuclear Plant – 2005 to 2007.
- Geotechnical consultancy and slope stabilization along Interoceanic Corridor (Peru) – 2006.
- Slope stabilization project at km 810 of BR-040 – 2006.
- Retaining structure for residential building in Rio de Janeiro – 2006.
- Geotechnical risk assessment and stabilization design for Morro do Escalavrado (BR-116/RJ) – 2006.
- Emergency slope stabilization on BR-393 – 2006.
- Rockfill stability study at Angra Nuclear Plant – 2007.

- Retaining structures for Bosque dos Cavaleiros development, Macaé (RJ) – 2007.
- Emergency recovery of tieback wall instability, RJ-142 – 2007.
- Basic slope stabilization design – Nova Iguaçu (RJ) – 2008.
- Slope stability studies for Barra do Furado Canal – 2008.
- Retaining projects for PAC urbanization program (Pavão-Pavãozinho/Cantagalo, Rio de Janeiro) – 2008.
- Retaining and earthworks projects for Pinalito Hydroelectric Project (Dominican Republic) – 2008.
- Slope stabilization projects at Brazilian Navy Naval School, Angra dos Reis (RJ) – 2010.
- Executive slope stabilization projects for landslides in Angra dos Reis (RJ) – 2010.
- Stability studies at Navy fuel storage facility, Rio de Janeiro – 2010.
- Slope stabilization after landslides in Niterói (RJ) – 2010.
- Excavation studies near metro gallery, Rio de Janeiro – 2010.
- Retaining projects along BR-040 (mountain section) – 2010/2011.
- Earthworks and slope stabilization for Pousada da Glória Condominium – 2010.
- Bridge abutment retaining structures on BR-101 – 2010/2011.
- Geotechnical consultancy for slope stability in Petrópolis (RJ) – 2010/2012.
- Landslide stabilization projects in Angra dos Reis – 2010/2011.
- Retaining structures for macrodrainage pumping station in Macaé (RJ) – 2011.
- Slope stabilization along BR-116/RJ – 2011.
- Slope stabilization and drainage for residential recovery, Itaipava (RJ) – 2011.
- Retaining works for Hotel Glória, Rio de Janeiro – 2011/2012.
- Railway embankment stabilization (MRS) – 2011 to 2015.
- Geotechnical diagnosis and intervention plans (Morar Carioca Program) – 2012.
- Geological-geotechnical mapping in Dominican Republic – 2012.
- Slope stabilization project on BR-101 – 2012.
- Retaining works for COSAN facility – 2012.

- Multiple slope stabilization projects along BR-116 – 2012/2013.
- Retaining works in Nova Friburgo (post-2011 disaster) – 2012 to 2014.
- Tieback wall project for Maduriacu Hydroelectric Project (Ecuador) – 2013.
- Retaining structures for Hotel Campanile, Rio de Janeiro – 2013.
- Retaining projects for residential developments (MDL Realty, Odebrecht, etc.) – 2013/2014.
- Multiple retaining and stabilization projects along Transolímpica corridor – 2013 to 2016.
- Geotechnical studies and retaining design for BR-040 (Invepar, OAS) – 2014/2015.
- Railway slope stabilization projects (MRS) – 2015.
- Retaining projects and quality control along Transbrasil corridor – 2015 to 2023.
- Rock block stabilization at São Simão Dam – 2016.
- Reinforcement of tieback walls along Ferrovia do Aço – 2017.
- Riverbank stabilization at Madeira River (Amaggi) – 2017.
- Railway embankment stabilization at Ponta da Madeira (Vale) – 2017.
- Rock slope stabilization projects for MRV developments – 2019 to 2020.
- Geotechnical consultancy for Vale's Salobo III Project – 2019–2023.
- Extensive geotechnical consultancy, certification, and design for Vale assets across Brazil – 2020–2024.
- Geotechnical consultancy for FICO railway project – 2021–2024.
- Multiple recent projects involving slope stabilization, railway infrastructure, ports, and urban developments – 2022–2026.

2. Foundations

- Foundation reinforcement design for damage remediation at Rua Dona Clara 449, House 1, Jardim Califórnia Condominium, São Gonçalo (RJ), for Unibanco Seguros S.A. – 1997.

- Foundation reinforcement design for damage remediation at Rua 59, Block 68, Lot 06, Piratininga, Niterói (RJ), for Unibanco Seguros S.A. – 1997.
- Technical opinion regarding ground settlements observed along the access road to Palácio Guanabara and their possible correlation with excavation works for installation of an underground duct bank for power transmission lines (Light – Serviços de Eletricidade S/A), Rio de Janeiro (RJ), for Construtora CG Ltda. – 1998.
- Foundation design for the Blue Tree Park Resort – TANGUÁ Hotel Complex, Angra dos Reis (RJ), for Contemat Engenharia e Geotecnia S.A. / Construtora AKYO / FUNCEF – 1998 to 2001.
- Analysis of geotechnical and foundation projects for the Recife Metro (Recife–Cajueiro Seco section, Lots 1 and 2), for Maia Melo Engenharia Ltda. / CBTU – 1998 to 2002.
- Foundation design for the platform roofing of Ricardo de Albuquerque Railway Station (RJ), for Estacon Engenharia S.A. – 2000.
- Rehabilitation design of foundations and structural retaining wall at the Electoral Court storage facility (soft clay subsoil), Benfica (RJ) – 2000.
- Foundation consultancy for the construction of the Capuchin Church Pastoral Center building, Tijuca (RJ) – 2000.
- Foundation consultancy for residential construction at Wimbledon Condominium, Barra da Tijuca (RJ) – 2001.
- Foundation report for Cintra Brewery implementation, Piraí (RJ) – 2001.
- Foundation report for building at Rua Mapendi 935, Jacarepaguá (RJ), for BR4 Empreendimentos – 2001.
- Foundation report for expansion of Adega Ramos, Jacarepaguá (RJ) – 2001.
- Foundation consultancy for construction of the new Army Health School building, Triagem (RJ) – 2001.
- Analysis of foundation design for the Metrorec bridge over the Capibaribe River branch – 2001.
- Foundation design and construction supervision for residential development in Laranjeiras (RJ) – 2001/2002.

- Supervision of shallow foundation (spread footing) construction at the Army Health School infirmary pavilion, Benfica (RJ) – 2001/2002.
- Foundation design for toll plaza buildings along BR-040 (Rio–Juiz de Fora) – 2002.
- Foundation consultancy for the Cinema Museum and Oscar Niemeyer Foundation, Caminho Niemeyer, Niterói (RJ) – 2002.
- Foundation consultancy for Rio Polímeros project, Baixada Fluminense (RJ) – 2002.
- Consultancy and supervision of foundation works in Teresópolis (RJ) – 2002 to 2005.
- Foundation consultancy for multiple residential and real estate developments in Rio de Janeiro.
- Foundation report for residential building at Rua General Urquiza 133, Leblon (RJ), for Construtora Concal – 2006.
- Foundation report for residential building at Rua Lineu de Paula Machado 90, Lagoa (RJ), for Construtora Concal – 2006.
- Foundation design for Bosque dos Cavaleiros residential development, Macaé (RJ) – 2006.
- Methodology proposal for execution of pile caps (E28, E29, E38, E45, E46) at Thyssenkrupp CSA Substation 3 – 2007.
- Foundation and structural design for external areas of SENAI Training Center, Macaé (RJ) – 2007/2008.
- Studies on the use of precast concrete piles for LNG pipeline foundation (SDV-02 area), Duque de Caxias (RJ) – 2007/2008.
- Consultancy on treatment of soft soil areas for duplication of Carajás Railway (EFC), for Promon Engenharia – 2007/2008.
- Foundation report for pipe stack yard at Praia Mauá, for GDK Engenharia – 2008.
- Evaluation of foundation conditions in Guanabara Bay for anchoring systems for LNG pipelines, for GDK Engenharia – 2008.

- Crane foundation block design for LNG pipeline project, Campos Elíseos – 2008.
- Foundation and retaining projects for PAC urbanization program (Pavão-Pavãozinho/Cantagalo, Rio de Janeiro) – 2008.
- Foundation design for Del Monte residential condominium, Rio de Janeiro – 2007 to 2009.
- Structural inspection and retaining design for Canal do Fundão environmental recovery program, Rio de Janeiro – 2009.
- Foundation and earthworks design for AMIL – Cemed Care unit, Campo Grande (RJ) – 2009.
- Geotechnical studies for Ruta del Sol highway (Colombia), supporting Odebrecht concession bid – 2009.
- Foundation design for Mantis facility (FMC Technologies), Rio de Janeiro – 2011.
- Foundation design for macrodainage pumping station and pipeline crossing, Macaé (RJ) – 2011.
- Geotechnical consultancy and instrumentation analysis for soft soil treatment along Transoeste corridor, Rio de Janeiro – 2011.
- Foundation design for Hotel Glória (historic building), Rio de Janeiro – 2011/2012.
- Geotechnical consultancy for foundations and excavations at Museum of Image and Sound, Rio de Janeiro – 2011/2012.
- Geotechnical design for excavation and groundwater lowering near metro gallery, Rio de Janeiro – 2012.
- Foundation-related geotechnical projects for residential buildings in Jacarepaguá (RJ) – 2012 to 2014.
- Foundation design for Belo Monte Hydropower Project piers – 2012.
- Foundation design and supervision for Porto 1 Rio Corporate building – 2012/2013.
- Foundation design for Hotel Campanile, Rio de Janeiro – 2013.
- Foundation design for residential buildings (MDL Realty) – 2013.

- Geotechnical consultancy for foundation works at Aker installation, Macaé (RJ) – 2014.
- Studies and design for foundations and embankment treatment on soft soils (Nova Friburgo, RJ) – 2013/2014.
- Foundation design and supervision for residential developments (MDL Realty / Calper) – 2013 to 2017.
- Foundation consultancy and design for residential developments in Recreio dos Bandeirantes – 2013 to 2015.
- Soft soil treatment consultancy for Ruta del Sol highway duplication (Colombia) – 2013/2014.
- Geotechnical consultancy for foundation works at Porto Maravilha project, Rio de Janeiro – 2013 to 2015.
- Foundation design and supervision for residential building in Madureira (RJ) – 2013 to 2015.
- Foundation projects and construction supervision for CONTEMPORÂNEO development (20 buildings), Campo Grande (RJ) – 2013 to 2017.
- Foundation studies and projects along Transolímpica corridor – 2013 to 2017.
- Foundation studies and projects along Transbrasil corridor – 2015 to 2023.
- Geotechnical analysis and remediation measures for instability at SENAC facilities, Rio de Janeiro – 2017.
- Development of VALE Foundation Standard (PNR), including risk analysis (Bow-Tie methodology) – 2020.
- Geotechnical consultancy for foundation design and soft soil stability (Novartis project, Resende/RJ) – 2021.
- Consultancy and supervision of earthworks and foundations for ODATA data center, São João de Meriti (RJ) – 2022.
- Geotechnical consultancy for interpretation of static load tests (COMPERJ, Itaboraí/RJ) – 2021.
- Geotechnical consultancy for foundation design of mixed-use building in Botafogo (RJ) – 2026.

- Foundation engineering consultancy for bridge widening project over the Guandu River (RJ) – 2026.

3. Railway Geotechnology

- Research project for technological upgrading of railway track infrastructure – FLUMITRENS/COPPE agreement, comprising three stages: (i) definition of criteria for qualification and performance monitoring of ballast; (ii) track deformability as a qualification tool; (iii) proposal of a new railway track maintenance model – 1996/1999.
- Analysis of railway track performance at the Maria da Graça elevated section (Triagem) and Line 2 extension of Rio Metro, including evaluation of ballast crushing issues and other track problems, for Promon Engenharia Ltda. / Rio de Janeiro Metro Company – 1998.
- Technical supervision of refurbishment works at Ricardo de Albuquerque Railway Station (RJ), for Estacon Engenharia S.A. – 1999/2000.
- Coordination and execution of laboratory and field tests (characterization, permanent deformation, and strength) on steel slag for use as railway ballast, including comparative tests with conventional crushed stone ballast, for Supervia (RJ) – 2000 and 2004.
- Coordination and execution of characterization, shape, granulometry, and strength tests on LD steel slag for evaluation of its use as railway ballast in Rio de Janeiro suburban network, for Supervia – 2003.
- Consultancy for implementation of non-conventional railway track system to support operation of a 1,700 tf stacker-reclaimer, Ilha de Guaíba Terminal, Mangaratiba (RJ) – 2003.
- Study on spacing and dimensional changes of timber and steel sleepers using experimental sections on MRS railway network – 2003/2004.
- Consultancy and studies on optimized spacing and reduced dimensions of timber sleepers and optimized steel sleeper spacing for MRS railway network – 2003/2004.

- Consultancy for replacement of timber sleepers by concrete sleepers at Águas Claras branch, MRS – 2004.
- Study of freight train effects (MRS) on CPTM metropolitan railway tracks – 2004/2005.
- Studies and analyses for diagnosis and corrective measures for railway track between Visconde de Itaboraí and Silva Jardim (FCA network) – 2005.
- Studies and analyses of compensatory measures due to possible displacement of metro tunnel structures in Cidade Nova, Rio de Janeiro.
- Consultancy and studies for implementation of steel and plastic sleepers in MRS railway network – 2006 to 2010.
- Monitoring of iron ore train instrumentation on Ferrovia do Aço, evaluating braking system performance and other parameters.
- Inspection report of Guaianazes–Mogi das Cruzes railway section (CPTM).
- Design of railway pavement structure for stacker-reclaimer loading at Ponta da Madeira Terminal, for Promon Engenharia – 2007.
- Railway pavement design for expansion of Carajás Railway yard (São Luís, MA) – 2007.
- GPR data acquisition and analysis for railway section São Pedro da Água Branca–Marabá (VALE) – 2007/2008.
- Engineering services for ballast and sub-ballast specifications for Carajás Railway duplication – 2007/2008.
- Conceptual and basic design of railway pavement structures at Ponta da Madeira Terminal – 2007/2008.
- Executive design of railway pavement structure for Carajás Railway duplication (19 lots) – 2008 to 2010.
- Geological-geotechnical evaluation for coal railway feasibility studies in Colombia (Odebrecht / Camargo Corrêa) – 2008.
- Consultancy for implementation of steel and plastic sleepers across MRS railway network – 2011/2012.
- Railway pavement design for Moatize–Nacala Railway (Mozambique, Africa) – 2011.

- Geotechnical consultancy for track infrastructure works on Moatize–Nacala Railway – 2012.
- Revision of timber sleeper specifications for railway use (MRS) – 2013.
- Specification of ballast quality research project (MRS) – 2013.
- Technical specification for railway platform support analysis (MRS) – 2013/2015.
- Consultancy for ballast shoulder cleaning performance evaluation and fines removal (MRS).
- Evaluation of embankment and retaining structures stability under GDU wagon traffic, MRS railway network – 2015.
- Study of maximum load capacity of railway platform (36 t/axle), including ballast/sub-ballast design, identification of critical zones, and intervention methodologies – 2014.
- Railway platform support capacity analysis for 54 passing loops, including field tests (over 2,000 DCP tests), laboratory testing, and long-term performance analysis (VALE) – 2015/2017. Awarded **“Premiar Quem Faz 2017”** as best engineering project.
- Expert report on ballast aggregate – North-South Railway (Lot 05S) – 2016/2017.
- Specification of permanent deformation tests for ballast performance evaluation – 2017.
- Consultancy for railway pavement evaluation and design at Ponta da Praia Yard (Santos, SP) – 2016/2017.
- Expert report on ballast aggregate – North-South Railway (Lot 04S) – 2016/2017.
- Geotechnical report on railway accident (Ferrovia do Aço, km 26+775), for MRS – 2017.
- Design and monitoring of experimental track section with elastomers on Carajás Railway – 2017.
- Consultancy for stabilization of bridge embankment at Rio Vermelho (Carajás Railway, Marabá/PA) – 2019/2020.

- Consultancy for slope stabilization at VALE port terminal expansion (São Luís/MA) – 2019/2020.
- Railway engineering consultancy for renewal of 450 km of suburban railway network (Supervia, RJ), including inspections, field tests, structural analyses, and technical solutions – 2020.
- Railway platform support analysis and pavement redesign for Central Paraná Railway (RUMO) – 2020/2021.
- Railway pavement design solutions for underpass approaches (Americana–Cordeirópolis/SP), including geocell simulations – 2021.
- Subgrade and ballast diagnosis for Barra Funda–Campinas section, including investment estimation and design alternatives – 2022/2023.
- Specification for rockfill embankment access to railway bridge (Rio Mãe Maria, PA) – 2024.
- Numerical modeling (3D GTS NX) for railway pavement performance (Baixada Santista, SP) – 2024.
- Field inspection and diagnosis of CPTM railway lines (Lines 11, 12, 13) – 2025/2026.
- Feasibility assessment of ballasted track for stacking yard operations at Ponta da Madeira Terminal – 2026.
- Geotechnical consultancy on concrete sleepers for FICO railway – 2026.
- Geotechnical consultancy for railway pavement design (RUMO – Mato Grosso Railway expansion) – 2025/2026.

4. Tunnels

- Basic design of railway tunnel under Ibitaré–Belo Horizonte railway crossing with MG-040 highway, for MRS – 2002.
- Geotechnical report on railway accident involving embankment settlement caused by culvert collapse in NATM tunnel beneath the track, São Paulo Line, km 345+700, Taubaté (SP), for MRS – 2016.

- Geotechnical report on tunnel stability at km 184+300 of FCA railway, including stress-strain analysis, for VLI Logística – 2018.
- Geotechnical consultancy for inspection of 5 tunnels in the Central-Southeast Corridor (Araguari/MG), including 3D laser scanning, anomaly mapping, investigation planning, and technical reporting for VLI/PROGEO – 2019.

5. Earthworks and Pavements

- FEED-level design of industrial pavements for production units of the Rio de Janeiro Petrochemical Complex (COMPERJ), Itaboraí (RJ).
- Executive pavement design for the communities Parque Acari, Vila Rica de Irajá, and Vila Esperança, under the Favela-Bairro Program, Rio de Janeiro – 2002.
- Conceptual study for construction of 5 km of embankment over soft soil (thicknesses between 4 and 16 m) for duplication of BR-101 highway (Recife–João Pessoa section), for Construtora Queiroz Galvão – 2002.
- Consultancy services for construction over soft clay layers for the new alignment of Rua Vassalo Caruso (Rio Cidade II Project), Ramos (RJ), for ESTACON Engenharia S.A. – 2001/2002.
- Consultancy and supervision services for earthworks at Estrada José Gomes da Costa Júnior, Teresópolis (RJ) – 2002/2005.
- Geotechnical consultancy and studies for runway earthworks and evaluation of slope stability and deformability in drainage basin embankments in regions with porous/collapsible soils, for expansion of Brasília International Airport (DF) – 2004.
- Basic design for realignment of BR-101 to comply with the External Emergency Plan of Almirante Álvaro Alberto Nuclear Power Plant, Angra dos Reis (RJ) – 2004.
- Geometric design and earthworks for construction of 3.2 km of roads in Morada da Serra Condominium, Itaipava (RJ) – 2005.
- Studies and design for construction of highway embankment over compressible subsoil for access duplication to Suape Port, Recife (PE) – 2005.

- Basic design for construction of 30 km of embankment over soft soil – Campos Elíseos Ring Road (RJ) – 2006.
- Basic geotechnical design for BR-429 highway (embankment over soft soil), Rondônia – 2006.
- Geotechnical designs for soft soil areas (basic and executive phases) for COMPERJ implementation, Itaboraí (RJ) – 2007 to 2008.
- Verification of safety conditions for vehicle traffic over buried LNG pipelines near Duque de Caxias Refinery (Reduc), Duque de Caxias (RJ) – 2008.
- Executive earthworks design for erosion recovery along BR-163 (southern Pará), for Maia Melo Engenharia Ltda. – 2009.
- Technical report on road stability for temporary passage of loaded crane truck (Munck type), TEBIG Terminal, Angra dos Reis (RJ), for Galvão Engenharia – 2013.
- Design of rigid pavement for hazardous cargo yard on BR-493/RJ (Manilha–Itaguaí Port section), for Construtora OAS S.A. – 2016.
- Consultancy services in Civil Engineering, with Senior Engineer responsible for Geotechnics (foundations, earthworks, pavements) and multidisciplinary team, for detailed/executive design of UPGN Project (Natural Gas Processing Unit – COMPERJ), for Kerui–Metodo – 2018/2019.
- Specification of geotechnical investigations and preliminary analysis of settlements and need for soft soil treatment for Le Petit development, Rio de Janeiro (RJ), for MRV Engenharia – 2020.
- Geotechnical consultancy including test analysis and specification of additional investigations for foundation design and embankment stability over soft soils (Novartis project, Resende/RJ), for MRV Engenharia – 2021.
- Specification of geotechnical investigations and preliminary settlement analysis for Antares development, Rio de Janeiro (RJ), for MRV Engenharia – 2021.
- Specification of geotechnical investigations and preliminary settlement analysis for very soft soil conditions at Bolt development, Rio de Janeiro (RJ), for MRV Engenharia – 2021.

- Geotechnical, retaining, and foundation studies and designs (basic and executive phases) for widening works on BR-116/MG (Lots 02, 05, and 16), under EcoRioMinas concession, for Egis – 2025/2026.
- Pavement design solution for rehabilitation of EN-230 Highway (Catete–Maria Teresa section), Luanda, Angola, for BDM – 2026.
- Technical report on geotechnical aspects related to material quality and execution/productivity of embankments for duplication of the road-rail bridge over the Tocantins River, for VALE – 2025/2026.

6. Solid Waste Disposal and Environmental Geotechnics

- Study for definition of typical cross-sections and design of internal drainage for the São Bento Tailings Dam (MG).
- Study of contaminant transport through soils, including development of equipment and execution of tests to measure molecular diffusion and soil-contaminant interaction in fine soils.
- Construction of cover embankment over bauxite mining residue lagoon (ALCAN), Saramenha, Ouro Preto, for environmental rehabilitation of the area.
- Design of the sanitary sewage system for the municipality of Rio das Ostras (RJ).
- Environmental study for relocation of the Anta landfill, including site alternatives and guidelines for the new sanitary landfill in Sapucaia (RJ).
- Environmental closure design for waste disposal areas at Morro do Céu Landfill, for CLIN – Niterói Cleaning Company, Niterói (RJ) – 2005/2006.
- Geotechnical studies for implementation of the sanitary landfill in the municipality of Macuco (RJ) – 2006.

7. Groundwater Lowering (Dewatering)

- Geotechnical design to support staged excavation access ramp, groundwater lowering system for excavation works, and technical

inspection of metro gallery (blocks 23 to 25), Rua Júlio do Carmo, Cidade Nova, Rio de Janeiro (RJ), for HOCHTIEF do Brasil – 2011.

- Groundwater lowering design for excavation of three basement levels at Rua Primeiro de Março, nº 45, Centro, Rio de Janeiro (RJ), for HOCHTIEF do Brasil – 2014/2016.
- Geotechnical consultancy for executive design of groundwater lowering system for the parking building of Rio Design Leblon, Avenida Ataulfo de Paiva nº 270, Leblon, Rio de Janeiro (RJ), for HTB – 2025/2026.

8. Drainage

- Design of drainage works and treatment of eroded surface for slope recovery at property located at Avenida Orlando Brandão nº 225, Barra Mansa (RJ), for Sul América Seguros – 1997.
- Design of surface and subsurface drainage and waterproofing system to mitigate water infiltration issues in basement walls and slab of residence at Portobello Condominium, Mangaratiba (RJ), for CONTEMAT Engenharia e Geotecnia S.A. – 1999.
- Basic design of channelization of the Imboaçú River, São Gonçalo (RJ) – 2006.
- Executive drainage design for erosion recovery along BR-163 in southern Pará (Salto Curuá to Mato Grosso border), for Maia Melo Engenharia Ltda. – 2009.
- Drainage design for slope areas behind residential buildings at the Brazilian Navy Naval School, Angra dos Reis (RJ), for NBC Obras de Engenharia – 2010.
- Executive drainage designs for eight areas in Angra dos Reis and Ilha Grande (RJ), for Tecnosonda S.A. – 2010.
- Drainage projects for Morro do Bumba and Morro do Céu areas, Niterói (RJ), for Haztec Tecnologia e Planejamento Ambiental S.A. – 2010.

- Drainage design for damage recovery at residential property in Vale da Boa Esperança Condominium, Itaipava (RJ) – 2011.
- Executive drainage projects for Rua Alexandre, Anfiteatro, and Praça do Suspiro, Nova Friburgo (RJ), for Geomecânica S.A. – 2012/2014.
- Executive surface drainage design along BR-116 (Rio–Teresópolis–Além Paraíba), km 49.67, Rio de Janeiro – 2013.

9. Others

- Layout studies for the Container Terminal (Tecon 1), Port of Santos (SP), for Santos-Brasil S.A. – 1998.
- Layout studies for the Inland Customs Station of Campo Grande (RJ), for Multiterminais Alfandegados do Brasil Ltda. – 1998.
- Preparation of a report including geological-geotechnical characterization of the area, with subsurface profiles emphasizing layer genesis, foundation assessments, slope stability, and earthworks, supporting the implementation studies of the Macaé Merchant Power Plant (Thermoelectric Plant), for EL PASO Energy International, Macaé (RJ) – 2000.
- Preparation of an impact assessment report regarding adjacent construction to the building at Largo dos Leões nº 8, Humaitá (RJ) – 2001.
- Preparation of inspection report and technical supervision for identification of potential damages to neighboring properties due to construction at Rua Mário Pederneiras nº 55, Humaitá (RJ) – 2001.
- Consultancy services for guidance and technical supervision in the installation and monitoring of groundwater level instruments (water table monitoring), for implementation of the Military Peace Field, Vila Militar (RJ) – 2001.
- Consultancy services in Architecture and Engineering for preparation of proposal for concession bidding of the Foz do Iguaçu Customs Station (PR) – 2002.
- Studies and analyses for evaluation of loads and geometric adequacy of chassis ("skid") and excavation blades for pipeline burial equipment in shallow sediments of Guanabara Bay – 2006.

- Studies for development of Hydrogeological Monitoring Program for Cut 01 (km 229+060) of the North-South Railway (Northern section), Estreito (MA) – 2007.
- Measurement of deflections between blocks 34 and 36 in the metro gallery railway track, located along Rua Júlio do Carmo projection, Cidade Nova, Rio de Janeiro (RJ), for HOCHTIEF do Brasil – 2012.
- Technical services for preliminary evaluation of geological and geostuctural conditions along BR-262 duplication (km 71.71 to km 196.30), Espírito Santo, for Maia Melo Engenharia – 2013.
- Survey and preliminary analysis of issues along PE-009 Highway, between Cabo de Santo Agostinho and Ipojuca (PE), for Rota do Atlântico Concessionaire – 2014.
- Monitoring and analysis of instrumentation of embankment at km 196 (São Sebastião da Vitória district, São João del Rei/MG), Ferrovia do Aço, for MRS Logística – 2023 – present.
- Geotechnical consultancy for evaluation of allowable bearing capacity and definition of soft soil improvement solutions for lifting operations of Cantitravel service equipment for Joinville Bridge construction (SC), for ALLYA CONSTRUTORA S.A. – 2024.