

Name of firm: STUCKY Ltd

Surname and name of staff: LEITE RIBEIRO Marcelo

Date of birth: 11.06.1979

Nationality: Brazilian

Education

Date: 2006 – 2011
College/University: Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Degree obtained: **PhD. in Civil Engineering**, Research topic: Morphodynamics of channel confluences

Date: 2003 – 2005
College/ University: Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Degree obtained: **Master of Advanced Studies (MAS) in Hydroelectric Schemes**, Research topic: Reservoir sedimentation

Date: 1997 – 2001
College/University: Universidade Federal de Minas Gerais (UFMG), Belo Horizonte, Brazil (5-year program)
Degree obtained: **Civil Engineer with specialization in hydraulic engineering**

Membership of professional associations

International Association of Professionals in Hydraulic Schemes (IAPHS) –EPFL Alumni

Swiss Committee on Dams (SCD)

Other training

Countries of work experience

Brazil, Switzerland, France, Angola, Portugal, Georgia, Turkey, Iran, Mali, Philippines, and New Caledonia

<u>Languages</u>	Speaking:	Reading:	Writing:
Portuguese	Mother tongue		
French	Good	Good	Good
English	Good	Good	Good
Spanish	Good	Good	Good

Key qualifications

Dr. Leite Ribeiro is a Civil Engineer with specialization in hydraulic engineering. He has an MAS in hydroelectric schemes and a PhD in Civil Engineering (fluvial hydraulics).

He has more than 12 years of experience in hydraulic structures, streams management, sediment transport and development of hydropower schemes.

Employment record

Dates:	2011 – Ongoing
Employer:	STUCKY Ltd, Switzerland
Position held:	Civil engineer
Dates:	2003 – 2011
Employer:	Laboratory of Hydraulic Constructions (LCH / EPFL), Switzerland
Position held:	Research assistant and Civil Engineer
Dates:	2002 – 2003
Employer:	HE Consultoria de Engenharia, Belo Horizonte, Brazil
Position held:	Civil engineer
Dates:	2001
Employer:	HE Consultoria de Engenharia, Belo Horizonte, Brazil
Position held:	Trainee
Dates:	2000 – 2001
Employer:	Department of Hydraulic Engineering at UFMG
Position held:	Trainee

Works undertaken that best illustrate capability to handle the tasks

Project:	Vardnili HPP Rehabilitation
Dates:	04/2014 - Ongoing
Location:	Georgia
Client:	Engurhesi Ltd
Project features:	Vardnili 1 dam (60m high clay core rockfill dam) with three 70MW Kaplan units at its foot (P=210 MW); gated spillway ($Q_{max}=650 \text{ m}^3/\text{s}$) and a bottom outlet ($Q_{max}=470 \text{ m}^3/\text{s}$).
Position held:	Project Manager.
Activities:	Technical assistance to the Owner. Contractual and Project Management. Follow up of civil works (construction of new bottom outlet channel), hydromechanical and electrical works (rehabilitation of powerplant).
Project:	Bakhtyari Dam & HEPP – Construction
Dates:	05/2013 – Ongoing
Location:	Iran
Client:	Iran Water and Power Resources Development Co. (IWPC)
Project features:	Arch dam H = 325 m, Powerhouse 1500 MW
Position:	Deputy Project manager / Hydraulic Design Leader
Activities:	Review and approval of the contractors works (office and site). Assistance to the project manager for contractual management and technical coordination.

- Project: Fully Power scheme – Rehabilitation, Feasibility / Design / Tender**
Dates: 11/2012 – Ongoing
Location: Switzerland
Client: Forces Motrices de Fully (FMdF SA)
Project features: A HPP in the Swiss Alps which uses water inside the Fully reservoir (2135.7 m a.s.l.) to produce peak electricity inside the powerhouse « Belle Usine » in the plain of the Rhône River (492 m a.s.l.). The scheme has a gross head of 1644 m and an installed discharge of 460 l/s. The pressure tunnel of 0.5 to 0.6 m of diameter has a length of about 4.7 km. The HPP generates a power equal to 6 MW.
Position: Deputy Project manager / Project engineer
Activities: Assistance to the project manager for contractual management and technical coordination. Design of energy dissipation valves for the three power plants (H=140, 440 and 1050 m). Elaboration of the construction schedule for the three power plants.
- Project: Gouvães pumped-storage scheme – CFD Studies**
Dates: 11/2012 – 10/2013
Location: Portugal
Client: Iberdrola
Project features: New scheme with 660 m gross head, 160 m³/s installed discharge in turbine mode, underground powerhouse equipped with 4 reversible Francis units (4 x 220 MW).
Position: Deputy Project manager / Hydraulic engineer
Activities: Assistance to the project manager for contractual management and technical coordination. Three-dimensional computational modelling studies (FLOW3D) for the two intakes: validation and geometry optimisation.
- Project: Vardnili HPP Rehabilitation**
Dates: 11/2012 - Ongoing
Location: Georgia
Client: Engurhesi Ltd
Project features: Vardnili 1 dam (60m high clay core rockfill dam) with three 70MW Kaplan units at its foot (P=210 MW); gated spillway (Q_{max}=650 m³/s) and a bottom outlet (Q_{max}=470 m³/s).
Position held: Hydraulic Engineer.
Activities: Calculation of the hydraulic capacity of the existing spillway and bottom outlet, design of the new bottom outlet channel including two stilling basins and elaboration of the tender documents.
- Project: Fatsa HPP**
Dates: 03/2012 - 09/2012
Location: Turkey
Client: Turkuaz Elektrik Üretim A.Ş.(Borusan - EnBW)
Project features: Hydropower scheme consisted by two dams: Tanyeri (rockfill dam 100 m high) and Bolaman (rockfill dam 20 m high) and three hydropower plants: Tanyeri (2 MW, ecological flow) Kavsak (44.7 MW) and Bolaman (8.4 MW). Hydraulic system of the Kavsak plant consisted by a tunnel 7 km long (d=3.4 m). Tanyeri and Bolaman are placed on the foot of the respective dams. Spillway design discharges: Q_{PMF}=3056 m³/s (Tanyeri) and Q_{10'000}=1'854 m³/s (Bolaman).
Position held: Hydraulic engineer
Activities: Hydraulic design of the hydraulic system of Kavsak including the headrace

tunnel, the surge tank, the penstock and the entire hydraulic design of the Bolaman HPP (diversion of the river, water intake, penstocks, tailrace channel and spillway)

Project: **Cambambe dam - Heightening**
Dates: 2008 – Ongoing
Location: Angola
Client: Odebrecht Construction Company, Brazil; Engevix Engenharia, Brazil
Project features: Heightening of the arch dam constructed in 1962 from H = 60 m to H = 80 m. Modification of the spillway layout. Q = 9'000 m³/s.
Position held: Deputy Project Manager / Project engineer
Activities: Assistance to the project manager for contractual management and technical coordination. Elaboration of the construction drawings and follow up of the construction

Project: **Vieux Emosson arch dam - Heightening**
Dates: 12/2011 – 2012
Location: Finhaut, Valais canton, Switzerland
Client: ALPIQ, Nant de Drance SA, Switzerland
Project features: Arch dam H = 55 m (initial), heightened by 20 m (final height 75 m). This dam is the upper reservoir of the pumped storage scheme of Nant de Drance (900 MW).
Position held: Project engineer
Activities: 3D Numerical study (FLOW3D) of the effects of the Vieux Emosson dam break

Project: **Belep Archipelago - Renewable Energies**
Dates: 11/2011 – Ongoing
Location: New Caledonia, France
Client: Pléiades Ingénierie
Project features: Feasibility study of pumped-storage schemes (<1 MW) combined with solar and wind power systems
Position held: Project engineer
Activities: Finding potential sites for the implementation of pumped-storage power plants and study of alternatives.

Project: **French hydroelectric concessions Renewal**
Dates: Ongoing
Location: France
Client: Confidential
Project features: Confidential
Position held: Project Engineer
Activities: Technico-economic analyses of the schemes including studies of possible optimizations and finding potential sites for new projects.

Project: **Avançon-MBR**
Dates: 05/2011 – 06/2011
Location: Switzerland
Client: Consortium MBR
Project features: Revitalization of the confluence between the Rhone and the Avançon Rivers in the framework of the MBR run-of-river power plant.
Position held: Project engineer
Activities: 1D (HEC-RAS) and 2D (CCHE2D) morphodynamic calculations and design of alternatives.

- Project: Wawa Pumped-Storage Scheme**
Dates: 10/2011
Location: Philippines
Client: San Lorenzo Ruiz Water Power Development Corporation
Project features: Feasibility Study of a Pumped-Storage power plant (P=400 MW) between a dam to be constructed on the Wawa River and an Upper Dam to be constructed on the top of a hill.
Position held: Project Engineer
Activities: Proposition of an alternative for the project and its technique-economic study
- Project: Sanetsch Expertise**
Dates: 06/2011
Location: Switzerland
Client: Kraftwerk Sanetsch A.G.
Project features: Quinquennial safety inspection of the Sanetsch Dam (H=40 m)
Position held: Project engineer
Activities: Hydraulic capacity of the spillway and calculation of the stability of the dam
- Project: Fatsa Hydroelectric Scheme**
Dates: 06/2011
Location: Turkey
Client: Turkuaz Elektrik Üretim A.Ş.(Borusan - EnBW)
Project features: Hydropower scheme consisted by two dams: Tanyeri (rockfill dam 100 m high) and Bolaman (rockfill dam 20 m high) and three hydropower plants: Tanyeri (2 MW, ecological flow) Kavsak (44.7 MW) and Bolaman (8.4 MW). Hydraulic system of the Kavsak plant consisted by a tunnel 7 km long (d=3.4 m). Tanyeri and Bolaman are placed on the foot of the respective dams. Spillway design discharges: QPMF=3056 m³/s (Tanyeri) and Q10'000=1'854 m³/s (Bolaman).
Position held: Project engineer
Activities: Technico-economic analyses of the projects.
- Project: Mutsee Dam**
Dates: 05/2011
Location: Switzerland
Client: AXPO hydro Energie, Switzerland
Project features: Construction of the Mutsee gravity dam (H~30 m and crest length L~1 km)
Position held: Project engineer
Activities: Roll stability analyses of the dam
- Project: Chancy-Pougny hydroelectric scheme**
Dates: 04/2011 – 06/2011
Location: Switzerland/France
Client: Forces Motrices de Chancy-Pougny
Project features: Run-of-river hydroelectric scheme located on the Rhone River on the border between France and Switzerland (P=50 MW).
Position held: Project Engineer
Activities: Construction and exploitation of a 3D numerical model (FLOW3D) for calculating hydraulic capacity curves of the spillways.

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- Project:** **River Space Management Research Project**
Dates: 06/2006 – 02/2011
Location: Switzerland
Client: Swiss Federal Office for the Environment (FOEN)
Project features: Laboratory study of the influence of the tributary widening on confluence morphodynamics in the framework of river rehabilitation projects.
Position held: PhD student
Activities: Management of the project, experiment runs, analyses and reporting.
- Project:** **Piano Key Weirs Parametric experimental study**
Dates: 01/2009 – 04/2011
Location: Switzerland
Client: Electricité de France (EDF)
Project features: Laboratory study of Piano Key Weirs (type of labyrinth weirs).
Position held: Project Manager
Activities: Supervision of the experiment runs, analyses and reporting.
- Project:** **Choranche Dam**
Dates: 03/2008 – 09/2008
Location: France
Client: Electricité de France (EDF)
Project features: Hydraulic model tests for the increase of the spillway capacity from 500 m³/s to 720 m³/s by increasing the maximum upstream hydraulic head. The problem concerned cavitation's risk associated to the spillway operation with upstream hydraulic head higher than the crest design head.
Position held: Project engineer
Activities: Experiments run, analyses and reporting.
- Project:** **Viège City**
Dates: 11/2006 – 04/2007
Location: Switzerland
Client: Viège City
Project features: Lateral overflow of the Vispa River upstream of the confluence with the Rhone River in case of discharges higher than 500 m³/s. The aim of the project was the definition of the overflow zones, the design of the energy dissipation structures and routing of the overflow discharge towards the Rhone River.
Position held: Project engineer
Activities: Hydraulic and structural calculations and reporting.
- Project :** **St-Marc Dam**
Dates : 03/2006 – 10/2006
Location : France
Client : Electricité de France (EDF)
Project features: Hydraulic model tests for the increase of the spillway capacity from 620 m³/s to 750 m³/s. A Piano Key Weir (type of labyrinth weirs) was constructed for the overflow increase.
Position held: Project engineer
Activities: Experiments run, optimization of the PKW and the downstream energy dissipation system, analyses of the results and reporting.

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- Project: **3rd Rhone River Correction**
Dates: 01/2004 – 02/2006
Location: Switzerland
Client: Valais Canton
Project features: Rehabilitation of the Upper Rhone River associated to the increase of the flood protection.
Position held: Project Engineer
Activities: 1D Numerical model construction, calibration and reporting.
- Project: **Punt dal Gall Dam**
Dates: 10/2003 – 10/2005
Location: Switzerland
Client: Engadiner Kraftwerke AG (EKW)
Project features: Sedimentation of the Livigno Reservoir (9km long with capacity of $164 \times 10^6 \text{ m}^3$) due to turbidity currents.
Position held: Project Engineer
Activities: Numerical model construction, calibration and reporting.
- Project: **Fumaça SHPP**
Dates: 01/2002 – 06/2002
Location: Brazil
Client: Alcan Alumínio do Brasil LTDA
Project features: Low head HEPP in the River Gualaxo do Sul (P=10 MW) forming a reservoir with 2 km² of surface.
Position held: Project Engineer
Activities: Study of the backwater effects due to the reservoir formation.
- Project: **Candongá HPP**
Dates: 2002
Location: Brazil
Client: Alcan Alumínio do Brasil LTDA and Companhia do Vale do Rio Doce
Project features: HEPP in the Doce River (P=60 MW).
Position held: Project Engineer
Activities: Fishpass design.
- Project: **Jurumirim HPP, Cantagalo HPP, Brito SHPP and Bom Retiro HPP**
Dates: 2002
Location: Brazil
Client: Alcan Alumínio do Brasil LTDA
Project features: Feasibility projects of four low head HPP in a reach of the Piranga River (Jurumirim HPP P=48 MW, Cantagalo HPP P=30 MW, Brito SHPP P=23 MW and Bom Retiro HPP P=30 MW).
Position held: Project Engineer
Activities: Participation in the technical-financial feasibility study.
- Project: **Baguari HPP**
Dates: 2001
Location: Brazil
Client: CNEC Engenharia
Project features: Low head Baguari HPP feasibility project (P=140 MW, H=18 m).

Position held:	Project Engineer
Activities:	Participation in the technical-financial feasibility study.
Project:	Hydrologic-Hydraulic diagnosis of the Arrudas River Basin
Dates:	2000
Location:	Brazil
Client:	Belo Horizonte City
Project features:	Hydrologic and Hydraulic diagnosis of the Arrudas River Basin crossing the Belo Horizonte City. The project included hydraulic and hydrologic numerical modelling.
Position held:	Trainee
Activities:	Models construction, calibration, calculations and reporting.

Publications

- > **Leite Ribeiro, M.**, K. Blanckaert, A. G. Roy, and A. J. Schleiss (2012), "Hydromorphological implications of local tributary widening for river rehabilitation", **Water Resour. Res.**, 48, (2012), doi:10.1029/2011WR011296.
- > **Leite Ribeiro, M.**, Pfister, M. Schleiss, AJ, Boillat, J-L. "Hydraulic design of A-type Piano Key Weirs", **Journal of Hydraulic Research** (2012), DOI:10.1080/00221686.2012.695041
- > **Leite Ribeiro, M.**, Blanckaert, K., Roy, A. G., Schleiss, A. J., "Flow and sediment dynamics in channel confluences" **Journal of Geophysical Research**, Vol. 117, F01035 (2012), doi : 10.1029/2011JF002171, pp. 1-19
- > **Leite Ribeiro, M.**, Pfister, M., Boillat, J.-L., Schleiss, A., Laugier, F., "Piano Key Weirs as efficient spillway structure", **Proceedings (on CD) of the 24th Congress of CIGB –ICOLD**, 2-8 June 2012, Kyoto, Japan, Q. 94 – R. 13, pp. 176-186
- > Schleiss, A., **Leite Ribeiro, M.** "Einmündungen ökologisch aufwerten" **Tec21 (SIA)**, 10/2012, pp. 26-27
- > **Leite Ribeiro, M.**, Bieri, M., Boillat, J.-L., Schleiss, A., Singhal, G., Sharma, N., "Discharge Capacity of Piano Key Weirs" **Journal of Hydraulic Engineering**, Vol. 138, No 2 (2012), doi : 10.1061/(ASCE)HY.1943-7900.0000490, pp. 199-203
- > Blanckaert, K., **Leite Ribeiro, M.**, Schleiss, A. J., "Flow and sediment dynamics in bed discordant channel confluences" **The 7th IAHR Symposium on River, Coastal and Estuarine Morphodynamics (RCEM2011)**, 6-8 September 2011, Tsinghua University, Beijing, China, pp. 1555-1564
- > **Leite Ribeiro, M.** Blanckaert, K.; Boillat, J-L; Schleiss, A.J. "Elargissement local de l'affluent dans une zone de confluence ". **Wasser Energie Luft, Eau énergie air**, Acqua energia aria, vol. 3, num. 103 - 2011, p. 235-242.
- > **Leite Ribeiro, M.**, Boillat, J.-L., Schleiss, A. J., Laugier, F., "Coupled spillway devices and energy dissipation system at St-Marc (France)" **Proc. of International Conference on Labyrinth and Piano Key Weirs (PKW 2011)**, 9-11 February 2011, Liège, Belgium, Erpicum et al. (eds), ISBN 978-0-415-682282-4, pp. 113-121
- > **Leite Ribeiro, M.**, Boillat, J.-L., Schleiss, A. J., Le Doucen, O., Laugier, F., "Experimental parametric study for hydraulic design of PKWs" **Proc. of International Conference on Labyrinth and Piano Key Weirs (PKW 2011)**, 9-11 February 2011, Liège, Belgium, Erpicum et al. (eds), ISBN 978-0-415-682282-4, pp. 183-190
- > Pralong, J., Vermeulen, J., Blancher, B., Laugier, F., Erpicum, S., Machiels, O., Piroton, M., Boillat, J-L, **Leite Ribeiro, M**, Schleiss, A.J. "A naming convention for the Piano Key Weirs geometrical parameters." **Proc. of International Conference on Labyrinth and Piano Key Weirs (PKW 2011)**, 9-11 February 2011, Liège, Belgium, Erpicum et al. (eds), ISBN 978-0-415-682282-4, pp. 271-278.
- > **Leite Ribeiro, M.**, Blanckaert, K and Schleiss, A. J., Discussion of "Three-dimensional numerical study of flow structure in channel confluences", **Canadian Journal of Civil Engineering**, 38, 2011, pp. 124-126
- > **Leite Ribeiro, M.**, Boillat, J.-L., Schleiss, A. J., Blanckaert, K.; "Experimental study on a widening tributary channel and its influence on the confluence morphology", **River Flow 2010**, 8-10 September 2010, Braunschweig, Germany, Ed. Dittrich, Koll, Aeberle & Geisenhainer (eds), Bundesanstalt für Wasserbau, ISBN 978-3-939230-00-7, 2010, pp. 961-968

- > Le Doucen, O., **Leite Ribeiro, M.**, Boillat, J.-L., Schleiss, A. J., Laugier, F., "Etude paramétrique de la capacité des PK-Weirs" **Colloque SHF, Modèles physiques et hydrauliques**, Lyon 24-25 novembre 2009, pp. 155-160
- > Laugier, F., Lochu, A., Gille, C., **Leite Ribeiro, M.**, Boillat, J.-L., "Design and construction of a labyrinth PKW spillway at Saint-Marc dam, France" **International Journal on Hydropower & Dams**, Volume 16, Issue 5, Aqua-Media International, Sutton, Surrey, ISSN 1352-2523, pp. 100-107, **2009**
- > **Leite Ribeiro, M.**, Blanckaert, K., Boillat, J.-L., Schleiss, A. J.; "Influence of the momentum flux ratio on confluence morphology" **Proceedings of the 33rd Congress of IAHR**, ISBN: 978-94-90365-01-1, Vancouver, Canada, 9.-14. August 2009, CD-Rom, **2009**, pp. 4980-4987
- > **Leite Ribeiro, M.**, Bieri, M., Boillat, J.-L., Schleiss, A. J., Delorme, F., Laugier, F.; "Hydraulic capacity improvement of existing spillways – design of a piano key weirs" **Proceedings (on CD) of the 23rd Congress of the Int. Commission on Large Dams CIGB-ICOLD**, 25-29 May 2009, Brasilia, Volume III, Q.90-R.43, **2009**, pp.100-101
- > Bieri, M.; **Leite Ribeiro, M.**; Boillat, J.-L. ; Schleiss, A.J.; "Réhabilitation de la capacité d'évacuation des crues – intégration de "PK-Weirs" sur des barrages existants" **Colloque CFBR-SHF, Dimensionnement et fonctionnement des évacuateurs de crues, 20 – 21 janvier 2009, Paris**, ISBN: 2-906831-77-8; CD-Rom
- > **Leite Ribeiro, M.**; Wampfler, S.; Blanckaert, K.; Schleiss, A. J.; "Influence of the widening of a tributary on confluence morphology: preliminary results"; **Hydraulic Structures: Proceedings of the second international junior researcher and engineer workshop on hydraulic structures. Pisa, Italy. 30.07 – 01.08.2008.**, pp 195-202
- > Bieri, M.; **Leite Ribeiro, M.**; Boillat, J.-L.; Schleiss, A. J.; "Einsatz von Piano-Key-Wehren zur Erweiterung der Abflusskapazität von Hochwasserentlastungsanlagen". **10. Treffen Junger Wissenschaftlerinnen und Wissenschaftler an Wasserbauinstituten 6. – 9. August 2008, Innsbruck**, pp. 57-62
- > **Leite Ribeiro, M.**, Boillat J.-L., Kantoush S., Albalat C., Laugier F., Lochu A.; "Rehabilitation of St-Marc dam: Model studies for the spillways", Hydro 2007 "New approaches for a new era", Granada, Spain, 15-17 October 2007, papier 5.04, 2007
- > **Leite Ribeiro, M.**, Boillat J.-L., Schleiss A., Laugier F., Albalat C.; "Rehabilitation of St-Marc Dam Experimental Optimization of a Piano Key Weir", Proceedings of the 32nd Congress of IAHR, Theme C (C2.b-149-O), Venice, Italy, 1-6 July 2007, CD-Rom, **2007**
- > **Leite Ribeiro M.**, De Cesare G., Schleiss A.J., Kirchen G.F.; "Sedimentation management in the Livigno reservoir" **International Journal on Hydropower & Dams**, Volume 12, Issue 6, Aqua-Media International, Sutton, Surrey, ISSN 1352-2523, pp. 84-88, **2005**