

Jomâa Ben Hassine, PE, PhD

President

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▼ Key Qualifications

Leadership

- ❖ Team building founded on integrity, respect, encouragement, initiative taking and task ownership,
- ❖ Two decades in leadership positions within Due Diligence (DD), Engineer-Procure-Construct (EPC) and engineering consulting firms serving in roles such as Department Manager, Client Account Manager, Engineering Director, Director of Operations, etc.,
- ❖ Execution leadership and coordination of large infrastructure projects,
- ❖ Voting membership on leading standard development organizations such as the American Clean Power Association (ACPA), American Renewable Energy Standards and Certification Association (ARESCA), and American Society of Civil Engineers (ASCE).

Academic

- ❖ Author of a 2018 PhD dissertation titled “Direct Reliability-Based Design (d-RBD) of Shallow Wind Turbine Foundations,” at Colorado School of Mines, Golden, Colorado.
- ❖ Author of a 1988 MS thesis titled “Finite Element Applications in the Analysis of Nonlinear Problems in Geomechanics,” at the University of Tennessee, Knoxville, Tennessee.

Technical & Field

- ❖ 37 years of practical experience in geotechnical engineering, structural engineering, foundation design, soil-structure interaction, reliability-based design, geohazard recognition, geohazard mitigation and risk assessment.
- ❖ 18 years of engineering and construction experience in the renewables industry (utility-scale wind and solar, storage and transmission) serving in various roles (Owner Engineer, in-house Engineering Manager for a leading EPC, Engineering Consultant, Director of Operations, etc.)
- ❖ In-depth technical leadership in multiple engineering disciplines,
- ❖ Designated US Expert serving on the US Technical Advisory Group (US-TAG) to ANSI in the development of the IEC standard on wind turbine towers and foundations,
- ❖ Competent in the application of advanced numerical platforms for the analysis of geo-structures and soil-structure interaction problems (PLAXIS 3D, FLAC3D, MIDAS, etc.),
- ❖ Engineering analysis/design platforms: Bentley STAAD, ANSYS, RISA, SAFE, ETABS, ABAQUS, PLS-CADD, L-Pile, GROUP & others
- ❖ Co-developer of ASCE/AWEA RP 2011: Recommended Practice for Compliance of Large Land-based Wind Turbine Support Structures,
- ❖ Voting member of the ASCE technical committee working on the development of a national US standard for the design of foundations of buildings and other structures,

Management & QA/QC

- ❖ BSi-certified internal auditor of QA/QC systems, 2006,
- ❖ Responsible for setting up QA/QC procedures for firms of varying sizes and missions.

Professional Engineering Licenses

- ❖ USA: Alaska, Arizona, California, Colorado, Delaware, Florida, Illinois, Indiana, Iowa, Kansas, Maine, Michigan, Nebraska, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Puerto Rico, Rhode Island, South Carolina, Texas, Washington, Wisconsin, Wyoming
- ❖ Canada: Alberta, Ontario, Quebec, Saskatchewan.
- ❖ International: NCEES International Registry Certificate

Education

- ❖ December 2018: PhD in Civil Engineering, Colorado School of Mines, Golden, CO. Dissertation titled "Direct Reliability-based Design (d-RBD) of Shallow Wind Turbine Foundations" was a Rath Research Award finalist. GPA=3.8.
- ❖ March 1988: Master of Civil engineering, The University of Tennessee, Knoxville, TN. Thesis: "Finite Element Applications in the Analysis of Nonlinear Problems in Geomechanics." GPA=3.5.
- ❖ March 1985: Bachelor of Science in Civil Engineering, The University of Tennessee, Knoxville, TN. Graduated with Honors. GPA=3.3.

Languages

- ❖ English: fluent
- ❖ French: fluent
- ❖ Arabic: native

Work experience

07/23- Present: President, Civil Renewables, Inc., Denver, CO

President & Owner of an engineering consulting firm offering civil and geotechnical engineering services in the renewables industry throughout North America.

09/20 – 07/23: Director of Operations and Engineering, CTE Wind USA, Broomfield, CO

Managing North American office operations and providing project oversight at an industry-leading consultancy specializing in the design of onshore wind turbine foundations:

- ❖ Working with OEMs, EPC/BOP contractors, Developers, Owners and Operators to provide cost-efficient infrastructure solutions to wind energy projects across North America.
- ❖ Leading and integrating with an international team of about 35 world specialists focused on the design of onshore wind turbine foundations.

01/19 – 09/20: Principal Professional & Client Account Manager, Kleinfelder, Denver, CO

Client account management at a leading multi-disciplinary engineering consulting and construction firm:

- ❖ Leading business development, contract negotiations, scope of work development, scheduling, and budgeting of wind, solar, storage and T&D projects.
- ❖ Providing expertise in the renewable energy sector (wind, solar, transmission, storage, and regulation).
- ❖ Leading engineering design, due diligence reviews and general civil/geotechnical consulting.
- ❖ Team building and company leadership in the renewable energy marketplace.

06/17 – 01/19: President, Dyrasat Consulting LLC, Eastlake, CO

Freelance consultant dba Dyrasat Consulting LLC:

- ❖ Providing engineering design, review and due diligence services to contractors, consultants, owners, and investors in the renewable energy sector (wind, solar, transmission and storage)
- ❖ Providing civil engineering consulting services (geotechnical & structural) in various other industries.

10/07 – 06/17: Department Manager, Civil Engineering, RES Americas, Broomfield, CO

Managed the civil engineering department (≈20 direct reports) of one of the largest utility scale wind and solar energy developers and BOP contractors in the United States:

- ❖ Department leadership and management role:
 - Ensured efficient engineering support of the company's project development, pricing, sub-contracting, design, construction, and QA/QC activities,
 - Coordinated design and construction support of utility-scale renewable energy projects across the Americas,
 - Designed processes to facilitate consistent communication of project cost information; the "Green Sheet" summarizing design quantities became a standard company-wide tool for communicating key quantities between departments and with subcontractors,
 - Grew the department through candidate interviews and selection recommendations to upper management, and
 - Facilitated professional growth of team members.
- ❖ Civil engineering specialist and subject matter expert role
 - Provided expert support and risk assessment on challenging geotechnical and structural engineering situations,
 - Provided lead engineering role on hundreds of utility-scale wind and solar energy projects across North America and at various project phases, totaling over 7GW capacity.
 - Served as in-house expert to deal with engineering challenges such as mass concrete heat of hydration, cold weather concreting/grouting, alkali-silica reactions in concrete, shrink/swell and expansive soils, soft ground engineering, ground modification strategies, void/sinkhole risk assessment, corrosion protection, seismic design of wind turbine towers and foundations, fatigue life of various materials (concrete, grout, steel), frost heave of PV solar piles, etc.,
 - Took a leadership role in investigating construction quality issues to determine root causes and design mitigating solutions,

- Pioneered design and constructability optimization techniques for wind and solar foundations,
- Designed and implemented full scale wind turbine foundation instrumentation to measure applied bearing pressures, loads in anchor bolts and strains in concrete reinforcement,
- Served as US Expert on ANSI's Technical Advisory Group to TC-88 of the International Electrotechnical Commission (IEC) with contributions to standard development in the US and internationally,
- Pioneered the industry transition from the octagonal shallow gravity-based wind turbine foundation to the more efficient circular shape with radial reinforcement,
- Presented at various national and industry conferences and workshops to report on standards or challenges and developments in design/construction of wind turbine foundations, and
- Technical authority in all matters related to wind turbine foundation design in EPC/BOP projects.

06/06-10/07: Civil Engineering Director, Garrad Hassan (now DNV GL), San Diego, CA

Civil engineering due diligence leader for wind energy projects within the United States and globally:

- ❖ Reviewed design drawings, calculations, and geotechnical documents to verify adequacy of infrastructure designs (foundations, access roads, civil design, O&M buildings, substations, etc.) Verification is based on applicable design codes and standards specific to wind energy converters (US, Canadian, European, and international codes) and local codes,
- ❖ Prepared due diligence reports for project owners and investors identifying and assessing project risks,
- ❖ Reviewed proprietary foundation designs for possible certification,
- ❖ Performed project site visits to inspect construction quality and verify adherence to design drawings and specifications, and
- ❖ Helped grow the civil engineering department and made hire recommendations to upper management.

05/05 – 06/06: Structural Group Leader, Giffels, Inc., Southfield, MI

Leadership role in the following:

- ❖ Design and project tracking duties associated with industrial building projects and high-rise hotels and casinos,
- ❖ Lead engineer duties for structural repairs of commercial buildings and hotels damaged by hurricanes,
- ❖ Lead engineer role in the analysis and design of telecommunication structures and their foundations, as well as site civil design for such facilities,
- ❖ In-house expert role in devising innovative geotechnical solutions to challenging site conditions, and
- ❖ Facilitator of internal knowledge transfer within the department through the setup of a content management system with Intranet links to company procedures, design standards and resources.

12/02 – 05/05: Structural/Geotechnical Group Leader, ARCADIS, Southfield, MI

Lead engineer role in the design of industrial buildings, structures, and their foundations. Projects and tasks included:

- ❖ Auto-manufacturing plants with multiple crane runways and deep pits.
- ❖ Analysis and design of telecommunication structures and their foundations
- ❖ Site civil design.
- ❖ Geotechnical design for challenging site conditions through application of innovative solutions.

03/01 – 12/02: Lead Project Engineer, ARCADIS, Tampa, FL

Project engineering role in telecommunication civil infrastructure and commercial buildings. Tasks included:

- ❖ Task package management of telecommunication projects throughout the South-eastern United States. Clients included AT&T Wireless, Cingular, Alltel, Bechtel, SBC, Sprint PCS, and others.
- ❖ Analysis and design of telecommunication structures and their foundations.
- ❖ Design of tower and foundation modifications to improve load-carrying capacity.
- ❖ Geotechnical explorations, laboratory testing and report preparation.
- ❖ Analysis and design of foundations (shallow and deep), retaining structures and other structures.

06/97 – 03/01: Engineering Coordinator, ARCADIS Bouw/Infra, The Hague, The Netherlands (Stationed in Tunis, Tunisia)

Site project management for the design and construction of the Radès Olympic Stadium (Stade 7 Novembre), Tunisia, a Class 1, USD\$100M, 60,000-seat capacity soccer stadium that featured a tensioned membrane roof and was home of the 2001 Mediterranean Games. Tasks included:

- ❖ Lead engineer role on foundation design
- ❖ Coordination of all submittals for all trades to the client
- ❖ Coordination of consulting work packages with Tunisian subcontractors
- ❖ Coordination of shop drawing review for all project disciplines
- ❖ Representation of the design engineering firm (ARCADIS Bouw/Infra) at site project meetings and meetings with the Owner Engineer in Tunisia and France.

05/95 – 06/97: Staff Engineer, Geraghty & Miller (ARCADIS), Greenville, SC

As Staff Engineer, worked on foundation design of telecommunication towers (latticed, guyed, and monopoles), structural analysis of existing telecommunication towers for colocation purposes.

05/93 – 05/95: Staff Engineer, Piedmont Olsen Hensley, Chattanooga, TN

As Staff Engineer, worked as part of a team on:

- ❖ Geotechnical and geo-environmental investigations, including observation of drilling and sample collection operations, preparation of lab testing programs to ensure rational coverage of project area and features, and report preparation,
- ❖ Flexible and rigid pavement analysis and design,
- ❖ Landfill monitoring programs including subsidence monitoring and leachate / groundwater collection and testing, and dam seepage and stability analysis.

01/91 – 06/93: Adjunct Professor, Pellissippi State Technical Community College, Knoxville, TN

Taught introductory soil mechanics and construction materials to students pursuing associate technical degrees. Courses included teaching laboratory testing of soils, concrete, and asphalt concrete.

06/85- 01/91: Research Technician, University of Tennessee, Knoxville, TN

Research projects included field measurement of soil-structure interaction effects during a planned subsidence event to assess subsidence-induced structural damage and back-prediction using finite element modelling.

Publications

1. Ben-Hassine, J. (2018). Direct Reliability-based Design (d-RBD) of Shallow Wind Turbine Foundations. PhD Dissertation. Colorado School of Mines. Rath Award finalist.
2. Ben-Hassine, J., & Griffiths, D.V. (2013). Geotechnical exploration for wind energy projects. Proc., 18th International Conf. on Soil Mechanics and Geotechnical Engineering, Paris, France.
3. Ben-Hassine, J., & Griffiths, D.V. (2012). Reliability based design of shallow foundations subjected to combined loading with application to wind turbine foundations. CIMENICS 2012 – 11th International Congress on Numerical Methods in Engineering and Scientific Applications, Isla de Margarita, Venezuela, 26-28 March 2012.
4. Ben-Hassine, J., Nofal, M. (2009). "Implications of Consistent LSD/LRFD Implementation in the Design of Wind Turbine Foundations." Presentation delivered at ASCE Structures Congress 2009, Austin, TX.
5. Branca, W., Ben-Hassine, J. (2009). "Dynamic Analysis of a Turbine and its Foundation to Assess Liquefaction Potential of Bearing Soils" Proc., ASCE Structures Congress, Austin, TX.
6. Ben-Hassine, J., Booth, P.E., and Riggs, D. (1995). "Static and Seismic Stability of Residual Soils over a Bedrock Cavity." 5th Multidisciplinary Conf. on the Engineering and Environmental Impact of Karst, Gatlinburg, Tennessee, April 1995.
7. Fishman, K., Drumm, E.C., Ben-Hassine, J. and Ahmad, S. (1994). Influence of Interface/Joint Behavior in the Response of Structural Systems. Proc., 8th International Conference of the International Association for Computer Methods and Advances in Geomechanics, Morgantown, West Virginia, May 22-28, 1994.
8. Ben-Hassine, J. (1991). "Finite Element Analysis of Subsidence-induced Structural Damage," The Tunisian Scientific Magazine, 4(2), 58-61.
9. Drumm, E.C. and Ben-Hassine, J. (1990). "Computer Modeling for Damage Assessment of Surface Structures," Workshop on Mine Subsidence and Structures, 1990 National Symposium on Mining, May 1990, pp. 23-53.
10. Drumm, E.C., Kane, W.F., Kettle, R.H., Ben-Hassine, J. and Scarborough, J.A. (1990). Subsidence of Residual Soils in a Karst Terrain, Report# ORNL/TM11525, Oak Ridge National Laboratory and Martin Marietta Energy Systems, Inc.
11. Scarborough, J.A., Ben-Hassine, J., Kane, W.F., Drumm, E.C., and Kettle, R.H. (1989). "Surface Deformation of Residual Soil over Cavitose Bedrock, " Proc., 3rd Multi- disciplinary Conf. on Sinkholes, St. Petersburg Beach, FL, 24 Oct. 1989, pp. 143-9.

12. Ben-Hassine, J. (1987). Finite Element Applications in the Analysis of Nonlinear Problems in Geomechanics, Master of Engineering thesis, The University of Tennessee, Knoxville.
13. Ketelle, R.H., Drumm, E.C., Ben-Hassine, J., and Manrod, W.E. (1987). "Soil Mechanics Analysis of Plastic Soil Deformation over a Bedrock Cavity," Proc., 2nd Multi-Disciplinary Conf. on Sinkholes and the Environmental Impacts of Karst.
14. Drumm, E.C., Ketelle, R.H., Manrod, W.E., and Ben-Hassine, J. (1987). "Analysis of Plastic Soil in Contact with Cavitose Bedrock," Proc., ASCE Specialty Conf. on Geotechnical Practice for Waste Disposal, Ann Arbor, MI, June 1987, pp. 418-431.

Select Wind Projects

- ❖ Greenwich Wind Project, Ontario, Canada. Designed rock-anchored foundations taking advantage of very high-quality Canadian Shield granite to achieve optimal quantities and construction procedures for forty-three (43) Siemens 80-meter hub height turbines.
- ❖ Harbor Wind Project, Corpus Christi, Texas, USA. Designed a deep foundation system (thick mat supported on drilled shafts) to support 80-meter hub height wind turbines located at or very close to the shoreline and subjected to storm surge risks.
- ❖ Hatchet Ridge Wind Project, Shasta County, California, USA. Designed and monitored the construction of gravity base foundations to support forty-two (42) Siemens 80-meter hub height turbines. Project-specific considerations included seismic loading, slopes and landslides.
- ❖ Piñon Blanco Wind Project, Chile. Produced preliminary designs for Acciona wind turbine foundations in an area with severe seismic loading and challenging ground conditions. Also, helped coordinate the design of concrete tower options for the project. Project was sold prior to the opportunity of producing detailed designs.
- ❖ Chapman Ranch Wind Project, Nueces County, Texas, USA. Designed shallow gravity base foundations to support eighty-two (82) Acciona 90-meter hub height turbines. Many foundations required ground modification to improve bearing capacity. Foundations were designed to handle loads from hurricane winds. The wind project experienced design level load conditions without any reported issues when Hurricane Harvey passed through the area.
- ❖ Google Makani, Kern County, California, USA. Designed a unique foundation system to support a docking tower and anchor the experimental Google Makani Energy Kite in operation. Challenges specific to this project included load characterization and reliability-based design for the unique application.
- ❖ North Kent Wind Project, Municipality of Chatham-Kent, Ontario, Canada. Helped guide and support the design of foundations on challenging soft ground for a 100MW wind project consisting of forty-six (46) Siemens 90-meter hub height turbines. The typical foundation consisted of a circular mat supported on piles that penetrate the softer ground and are anchored to competent bedrock at depth. The design met all stiffness, settlement, and performance criteria for the project for the least possible cost.
- ❖ Countless Confidential Projects & Clients in the US, Canada, and Mexico. Provided multiple confidential clients with consulting services relative to new design ideas and systems for wind towers (steel, concrete, hybrid, etc.) and foundations.

Select Solar Projects

- ❖ Mighty Solar Energy Project, Dundas County, Ontario, Canada. Designed helical pile foundations for PV solar arrays in an area where pile jacking caused by freeze-thaw cycles is a concern. Project performance indicates that innovative design features were successful in addressing this issue.
- ❖ FRV Solar Project, Travis County, Texas, USA. Helped design driven pile foundations for PV solar arrays in an area where pile jacking caused by potentially expansive materials is a concern. Project performance indicates that innovative design features were successful in addressing this issue.
- ❖ Kellam Solar Project, Van Zandt County, Texas, USA. Geotechnical investigation, pile testing, and driven pile foundation design for a large utility-scale electrical generation PV facility.
- ❖ Rippey Solar Project, Iowa, USA: Geotechnical investigation, pile testing, and driven pile foundation design featuring proprietary technology for a large utility-scale electrical generation PV facility.
- ❖ Numerous Confidential Solar Projects & Clients in the US and Canada. Provided multiple confidential clients with consulting services relative to new design ideas and systems for utility-scale PV installations.