

TALL CONCRETE WIND TOWER STRUCTURES



WTT
WIND TOWER
TECHNOLOGIES

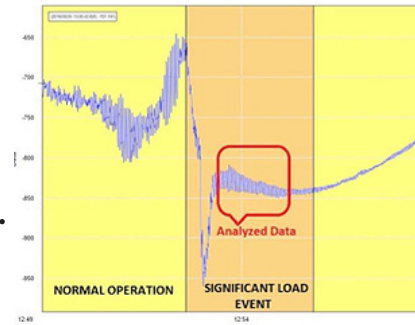
Reduced Cost Of Energy through Innovation & Engineering Excellence

PROFESSIONAL ENGINEERING

- Precast and Hybrid Designs to 160 m Hub Heights
- Foundation Design
- Failure Analysis and Remediation
- Tower and Foundation Remote Structural Monitoring

FAILURE ANALYSIS AND REMEDIATION

- Remote Monitoring
- Remediation Engineering and Procedures
- On Site Support

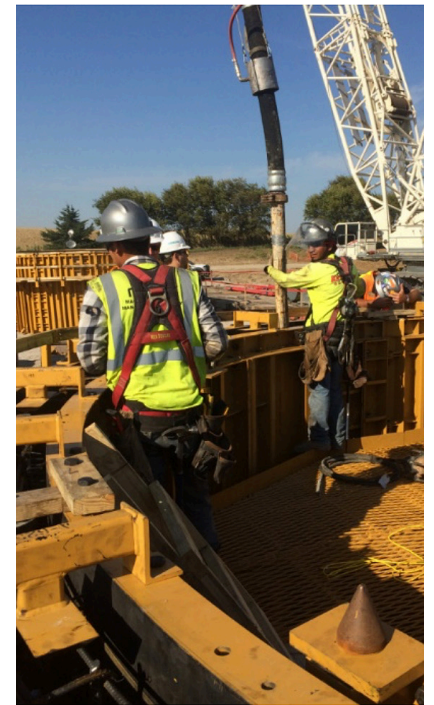


CONSTRUCTION MANAGEMENT

- Formwork and Special Equipment Procurement
- Global Supplier Network
- Production Process Improvement Support
- Safety Management Program

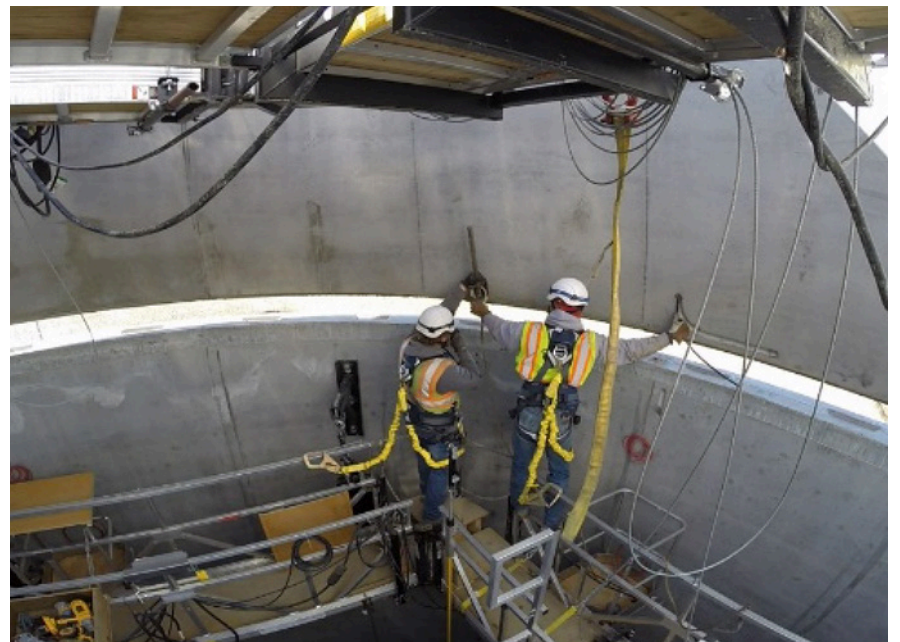
TECHNICAL FIELD SERVICES

- Materials and Construction Quality Assurance
- Geometry Control Procedures and Oversight
- Contractor Training on Site
- Inspection Services



REPOWER

- Reinforcing of Foundations and Towers
- New Loading Geotechnical and Structural Analysis
- Life Cycle Engineering



The History of WTT's Wind Tower System

Americas Market

DEVELOPED TECHNOLOGY

Tower Certification: TUVSUD 2016

- Developer: SIEMENS Gamesa
- Owner: MidAmerican Energy



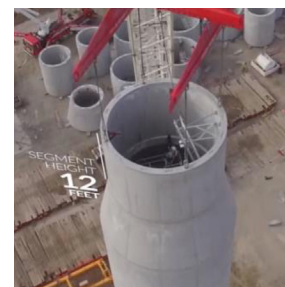
Match Casting Segments



Tower Erection of Segments



External Post-Tensioning



Patented Precast Segmental Tower Geometry to Expedite Construction



2.3MW Tower / 115 m to Hub:
First Precast Segmental US Tower

EMEA Market

INDUSTRIALIZED PRODUCTION

Tower Certification: CCS 2019

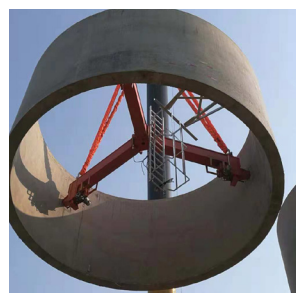
- 282 Towers
- Hub Heights: 120, 130, 140 m



Casting Yard Segments



Segment Transport On-Site



Segment Lifting Beam



WTT Industrialized On-Site Casting Operations

KEY PROJECTS

Wind Tower Benefits

- Match cast segmental construction is a **TESTED AND PROVEN** method of construction which proved very **COMPETITIVE** in the long span bridge industry.
- Segmental construction results in **FAST AND EFFICIENT** turbine installation methods which **REDUCES COSTS** over other tall tower alternatives.
- Concrete towers **REDUCE** the quantities of concrete and reinforcement required for turbine foundations.
- Match cast joints under continual compression **ELIMINATE** grouting and **INCREASE** tower design life to 50+ years.
- External post tensioning allows **EASE** of inspection during the turbines operational period.
- Reusable concrete segments reduce cost of future **REPOWERING** and are **ADAPTABLE** to support different turbine types, heights and sizes.



OUR EXPERIENCED TEAM



Jim Lockwood, P.E. CEO

Prior to establishing Wind Tower Technologies (WTT) and the Aero Wireless Group, Jim worked in Paris with Jean Muller and established and led the Chicago and New York offices of Jean Muller International (JMI) as Principal. He was CEO of EGIS, Inc. in New York, the US subsidiary of Groupe Egis, Paris - the parent company of JMI and multiple specialty engineering firms totaling 5,600. Jim worked internationally for 6 years, including Leonhardt and Andra, Stuttgart Germany; Jean Muller International, Paris; and a Fellowship at the Technical University of Denmark. Jim's expertise includes precast segmental construction technologies, advanced composite materials applications, long span cable supported bridges and large wind and communication towers. WTT's tower systems received a PTI Award of Merit and was cover story in ACI International for its record height and innovation. The Aero Wireless Group has received 3 Deloitte national awards, Inc. 5000, and was selected as a Colorado Company to Watch (CCTW) in 2018 by Governor's Office of Economic Development. Jim was recognized by McGraw Hill's ENR Magazine as a Top 25 Newsmaker, holds a BSCE from Univ. of Cincinnati and MSCE from Univ. of Washington, Seattle.



Panos Kiouisis, Ph.D. Technical Director

Panos, a member of Wind Tower Technologies' structural modeling, is design team and tenured professor emeritus of geotechnical and structural engineering for 30 years at the Colorado School of Mines. Panos has over 35 years of experience in the modeling, analysis, and design of integrated nonlinear soil-structure systems under static and dynamic loads and has authored more than 80 technical papers in peer-reviewed journals and conference proceedings on finite element methods of analysis, elastoplastic behavior of materials, geotechnical modeling, structural controls, concrete materials, FRP reinforced structures, and dynamic soil-structure interaction. In addition to his design activities, he leads WTT's fatigue analysis team that works with developers to solve re-powering solutions on existing wind towers in service under new turbine loadings and life cycle analysis.



Andrew Fowler, General Manager

Prior to joining Wind Tower Technologies, Andrew Fowler served as COO of RES Americas. His executive leadership directly contributed to the successful implementation of over 8,500 MW of wind, solar, and energy storage projects. He joined Sir Robert McAlpine Ltd., in 1989 and as a Construction Manager he worked on a number of large construction projects. In 1998, Andrew moved to their subsidiary RES Americas and grew with the company becoming the Executive Vice President of Construction and Engineering where he was responsible for leading the construction of the company's renewable energy projects. By developing the Company organically and leading the acquisition of complimentary construction companies Andrew led the US Construction business transforming it from a Construction Management company to a self performing design/build company with over 1,000 employees. In 2015, Andrew was given the responsibility to lead the Global Construction Group within RES as the company looked at ways to improve and globalize its business. Andrew has over 25 years of construction and engineering experience. He holds a B. Eng (Honors) in Civil Engineering.



Sihang Wei, P.E. Ph.D. Senior Structural Engineer

Sihang Wei is a senior structural engineer of Wind Tower Technologies, responsible for working with our engineering team in Boulder and Shanghai on WTT's wind tower activities in China. He also trains field engineers on site on quality control processes during casting and erection of the company's licensed tower system to our JV partner in China. Sihang performs the tower design, finite-element analysis, and also performs structural monitoring as well as data analysis of towers and foundations. Sihang holds a B.S. (Tongji University 2009) in civil engineering, M.S. and Ph.D (University of Illinois at Urbana-Champaign 2011, 2017) in structural engineering. Sihang serves on ACI committee 318-E on calculations to evaluate the proposals of modifying the current shear and torsion division.

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