IOWA STATE UNIVERSITY
Hexcrete Tower Project (DE-EE0006737)

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy
WIND & WATER POWER TECHNOLOGIES OFFICE

Hexcrete Tower for Harvesting Wind Energy at Taller Hub Heights – Phase II

Iowa State University

Slab Foundation Design

Markus Wernli, BergerABAM

Foundation Design Objective

1. Minimization of Construction Cost
2. Slab Foundation
3. Typical Soil in Iowa (173 kPa) – No Soil Improvement
4. High Durability, Minimum Maintenance
5. Constructability
6. Proven Technologies

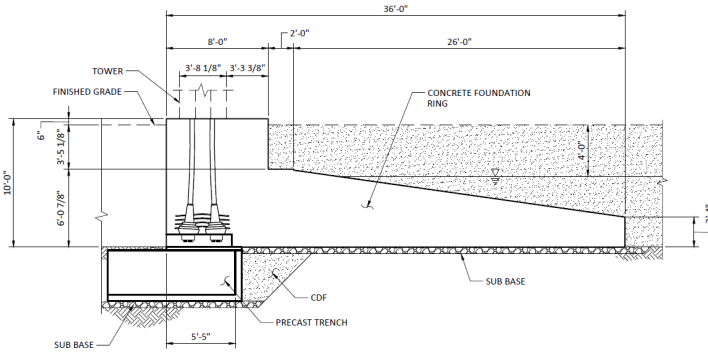
Design Considerations

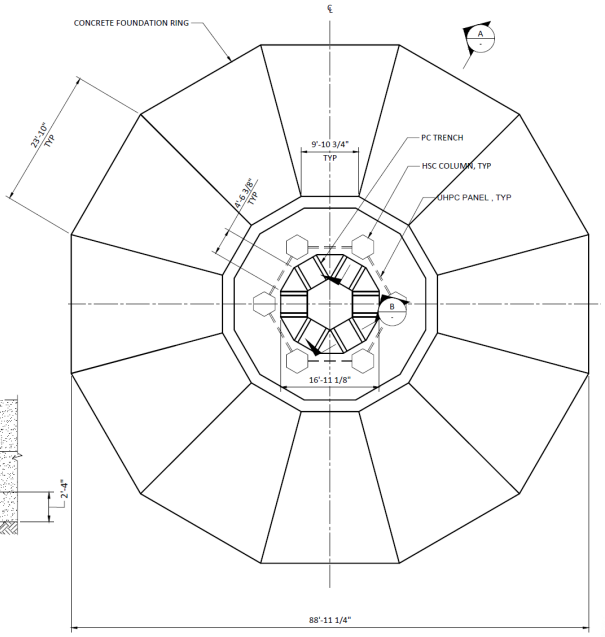
1. Overturning Moment
2. Tower/Turbine Weight
3. Fatigue
4. Designed to Prevent
   - Uplift under Normal Operation
   - Bearing Capacity Failure
   - Tilting
   - Sliding
   - Buoyancy
   - Settlement

Design Documents

1. Normative
   - ACI 318
   - Eurocode 2 EN 1992-1-1 “Design of Concrete Structures” (Fatigue)
   - AASHTO (Crack Control)
2. Guidelines and Standards
   - ASCE/AWEA RP2011 “Recommended Practice for Compliance of Large Land-based Wind Turbine Support Structures”
   - Germanischer Lloyd, “Guideline for the Certification of Wind Turbines”
   - FIB Model Code for Concrete Structures

Foundation Design





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Commercialization Workshop