SMALL CELL

A COMPLETE TURNKEY SMALL CELL SOLUTION
END-TO-END SMALL CELL SOLUTIONS

Black & Veatch offers a complete turnkey small cell service solution by leveraging our land services & acquisition, engineering, construction and project management.

INITIAL PLAN

Land services and site survey includes the following tasks:
- Data mining
- Contract execution
- Jurisdiction process: permitting, zoning, inspection
- Assessment of the existing macro network signal strength to determine optimal small cell transmit power and deployment location
- Define intended coverage areas
- Define capacity objective
- Define throughput objective
- Assessment required for each location and provide design
- Site design includes civil and RF design
- Collection of RF measurements as required
- FCC regulatory compliance

SMALL CELL RF DESIGN

Black & Veatch RF professionals are proficient RF designers. RF design ensures and includes, but is not limited to:
- Optimal signal distribution throughout the coverage area
- Coordination between indoor and outdoor RF environments when required
- Hand-off failures mitigation
- Interference mitigation
- Macro network integration when required
- RF testing
- Frequency coordination

BACKHAUL ANALYSIS AND DESIGN

Black & Veatch will perform design and analysis of backhaul and transport networks for optimal performance and cost.

BLACK & VEATCH U.S. REGIONAL OFFICES

Black & Veatch has regional offices in 28 states plus the District of Columbia.
WHY BLACK & VEATCH FOR SMALL CELLS

Technology
- Deployment experience with all major wireless technologies such as CDMA, WiMAX, UMTS and LTE
- Experience with fiber backhaul, microwave backhaul technologies and IP networks

Skills
- Professionals are proficient with site acquisitions and both indoor and outdoor RF design, optimization and commissioning
- Professionals are trained on “end to end” small cells solutions and are Level 1 & 2 RF design certified

Experience
- One out of every four cellular sites in the United States designed, integrated or constructed by Black & Veatch
- Performed RF design networks on over 10 million wireless low powered mini radios for “smart metering” purpose
- Deployed outdoor small cell for major U.S. operators

BLACK & VEATCH SMALL CELL SERVICE OFFERINGS

PLAN
- Land Services and Site Survey
- Small Cell RF Design
- Backhaul Analysis and Design

BUILD
- Installation, Commissioning and Acceptance
- Small Cell Testing and Acceptance

BUILD
Black & Veatch has a dedicated team of experienced regional professionals that work to minimize installation and faster site acceptance.

INSTALLATION AND DEPLOYMENT
- Installation performed according to the original equipment manufactures (OEM) instructions, RF design and backhaul design plans
- Ensure optimal signal distribution and coverage as designed
- Small cell operation validation:
  - Backhaul
  - Fiber
  - E911 call validation when required
  - Testing as required

SMALL CELL COMMISSIONING, TESTING AND ACCEPTANCE
With the latest data collection and post processing tools, Black & Veatch will perform commissioning as follows:
- Perform required test using appropriate tools and equipment
- Coverage and evaluation testing
- Perform validation as required
- Tuning-retuning as required
- Deliver small cell to client with required closeout documentation
BUILDING A WORLD OF DIFFERENCE®

Black & Veatch is an employee-owned, global leader in building critical human infrastructure in Energy, Water, Telecommunications and Government Services. Since 1915, we have helped our clients improve the lives of people in over 100 countries through consulting, engineering, construction, operations and program management. Our revenues in 2014 were US $3 billion. Follow us on www.bv.com and in social media.

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