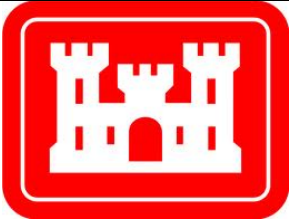




References

FORT BELVOIR COMMUNITY HOSPITAL – WIRELESS COMMUNICATIONS

Customer: U.S. Army Corps of Engineers (USACE)	
Performance Period: 2010 – 2011	
Status: Successfully Completed	

The new Fort Belvoir, Va., just south of Washington, D.C. is a \$747 Million medical treatment facility that will be opening its doors in late summer 2011. It is a facility designed for National Capitol Area active and retired military and their families. Groundbreaking for the new state-of-the-art health care facility was started in 2007, marking the beginning phase of a new era in military health care in the National Capital area and is part of the 2005 Base Realignment and Closure (BRAC) program



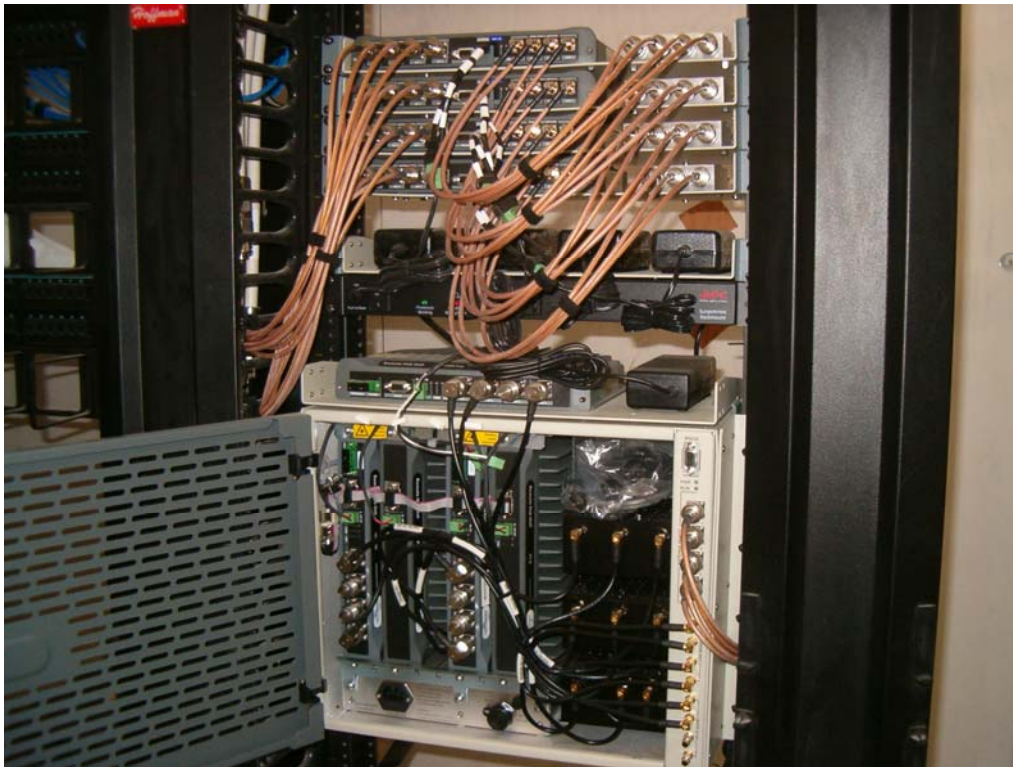
The hospital was designed by a joint venture team of HDR, Alexandria and Dewberry of Fairfax, Va. Both are AE design firms. It is being constructed by the joint venture comprised of Turner Construction of Arlington, Va., and Gilbane Building Company, based in Providence, RI. Morcom worked on this project as a sub-contractor of M.C. Dean (the electrical contractor of the project).

The 1,275,000 sq. ft. military construction project features a six-level community hospital, including medical administration areas. The design includes 120 in-patient beds, a 10-bed intensive care unit, a 10-bed behavioral health inpatient unit, a cancer

center, an emergency department, pharmacy, operative services center with 10 operating rooms, diagnostic centers such as pathology and radiology, and modular clinic space dedicated to outpatient services. Additional space is planned for future outpatient expansion. In addition to the square footage of the facility itself, the project includes two parking garages and surface parking for 3,500 parking spaces, a helipad, ambulance shelter and dedicated central utility plant.

Morcom's task was to design, install, test and commission an in-building wireless system throughout all the indoor areas of the hospital capable of providing the following services:

- 800MHz and 1,900MHz cell service (Verizon and AT&T)
- UHF EMS
- Trunked 800MHz radio frequencies (fire and police)
- 2.4GHz Wi-Fi for a Vocera system
- 900MHz paging re-broadcast indoors





References

The design required a careful balance between the coverage requirements dictated by such a large area and multitude of services and the limitations of the budget. The Morcom design team had to come up with the optimal solution to these constraints.

One of the most challenging issues was to provide enough density of indoor antennas as required by the wireless Vocera telephone service used throughout the hospital (35 ft. radius antenna spacing) and the limitations imposed by physics as far as avoiding co-location interference from neighboring antennas and even from antennas located in the same spot of two different floors.

Morcom used Mobile Access[®] equipment for the head-end and the remote units. The complete system uses a three-rack headend housing the Mobile Access conditioner and ancillary modules and 40 remote cabinets (installed in the telecom closets of the hospital). There were over 490 antennas required to provide coverage in all areas.

In addition, Morcom had to provide paging re-broadcast inside all areas of the hospital. The Army uses the services of U.S. Mobility which transmits pages in the 929MHz band. Morcom installed a donor antenna and BDA combination to bring in the signal into the head-end and then distribute it throughout the DAS together with the other services.

