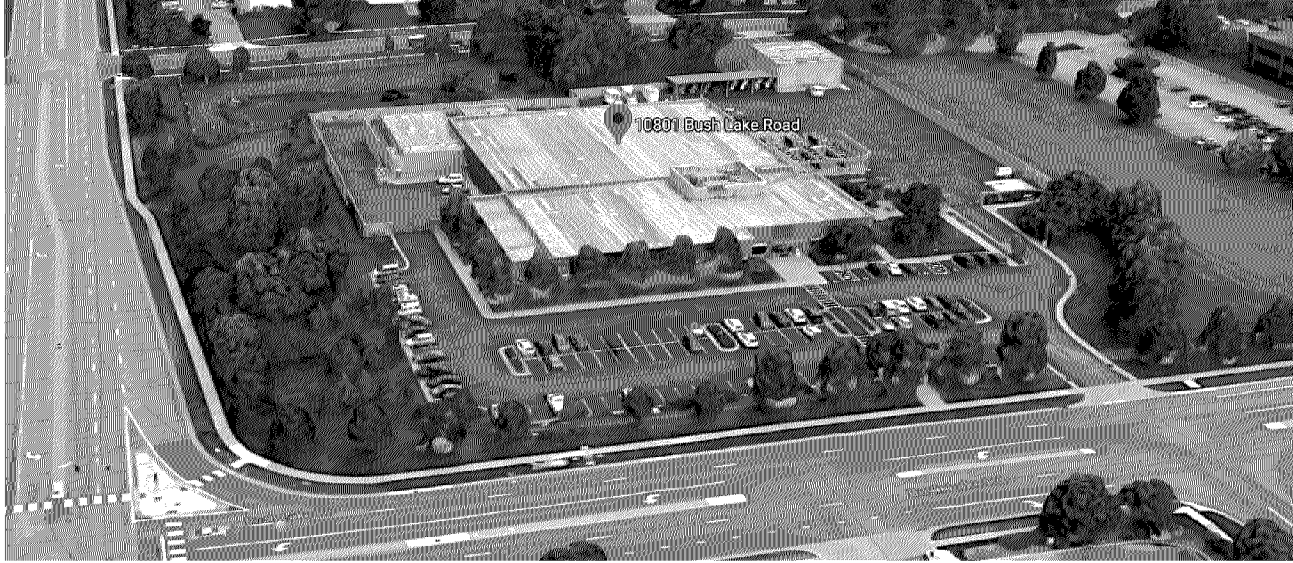




Bloomington Building Expansion

Design Memo

Verizon Wireless

10801 Bush Lake Road,
Bloomington, MN.

April 28, 2020

Private & Confidential



MORRISON HERSHFIELD
MISSION CRITICAL

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1.0 EXECUTIVE SUMMARY

Morrison Hershfield (MH) was retained by Verizon Wireless (VzW) to provide design services for an expansion to the MSC at the Bloomington mobile switching center (MSC) located at 10801 Bush Lake Road, Bloomington, MN. Additional consultants include Sunde Engineering for survey and civil design and ESI for acoustic analysis and design. A landscape architect will be engaged for the project as well.

The Bloomington MSC expansion is designed to accommodate the new Verizon high density concept which includes a new +/- 7000SF Network Equipment Room, electrical distribution rooms, UPS /battery rooms, and associated cooling systems.

The existing Bloomington MSC site is a 9.5-acre parcel with a 52,587 SF single-story RNC / MSC. Site access is from the west at Bush Lake Road. An open parking lot at the front of the building includes ninety-nine (99) parking spaces with four (4) handicap spots. There are an additional nine (9) parking spaces located within the 'secure' portion of the site for a total of one hundred seven (107) spaces. Covered mobile asset parking is located south-east of the building within the 'secure' portion of the site. Motorized vehicle gates, operated by card readers, provide access from the front parking area to the 'secure' portion of the complex. There is also a gate at the east side of the security wall near the loading dock. This access point is utilized by delivery trucks entering and exiting the site.

The Bloomington MSC Expansion is designed as a single-story building that is sited to utilize the available unbuilt area to the north of the existing facility. The proposed location of the expansion is designed to accommodate the required Network Equipment Room and Electrical Rooms as well as an exterior Equipment Yard to accommodate new mechanical equipment and two new 3MW generators, while providing truck and vehicle access to this equipment.

Prior to engaging Morrison Hershfield, Verizon obtained a Feasibility Study for this site. This study determined that the open space on the north side of the existing building is the most appropriate location for the expansion, providing the least disruption to the ongoing operation of the facility. The east side of the building is constrained by the existing retaining pond. The south side of the building is limited by the existing mechanical and electrical equipment that is required to maintain the 24/7 operation of the facility. The west side of the building is the front entrance and contains the parking for the building.

The Expansion building elevations are intended to maintain the same aesthetic look as the existing building for both the building and the screenwall. The existing building is composed of several types/colors of brick and these colors will be matched on the expansion as closely as possible. The existing screen wall serves to secure the service and equipment areas, and is constructed of two colors of split and smooth face CMU.

The Expansion provides the HD concept 1000kW with the +/-7000sf Network Equipment Room. The locations of the AC Power Rooms and UPS Rooms are located for efficient power deliver and to minimize the required feeder lengths between equipment. The locations of the electrical rooms also respond to the conditions of the existing building to provide an efficient use of floor space. The new generators are located in close proximity of the existing generators to expedite fuel delivery and to better address noise control requirements.

The proposed mechanical design is based on the use of exterior Air Handling Units for the mechanical system serving the Network Equipment Room. These units are placed along the long north side of the Network Room to provide air into the plenum providing even air distribution throughout the Network Equipment Room. The AC Power Rooms and UPS Rooms are cooled using DX CRAC Units with exterior condensers.

The following criteria has been used. The information below is a synopsis of the HD Basis of Design received from Verizon Wireless.

Architectural

- New 7,000sf (nominal) of Network Equipment Room with an overall nominal maximum power density of 1400kW or approximately 200w/sf.
- Network Room with a 36" Raised Floor and 12 aisles of 14 cabinets (30" x 48") – 168 nominal.
- Hot Aisle containment is implemented.
- Network Room designed to permit use as a Data Center separated into individual secure caged spaces.

Structural

- The structural design, modification of existing systems and installation will comply with current NSTD 398, Structural Systems in Switching Center Design and NSTD119, Network Installation Standard.
- 2500psf per 10kW cabinet at Network Equipment Rooms.

Mechanical

- Projected cooling demand of 1400 kW equipment demand plus environmental demand.
- HVAC system, package units, with N+1 capacities at Network Equipment Room. Three units will be installed as 'Day One', two additional units provided as 'Day Two' and space provided for one additional future unit.
- AC Power and UPS / Battery Rooms conditioned by DX CRAC units in an N+1 configuration.
- Hot aisle containment at equipment room.
- A dehumidification system for the switch room if necessary.
- Central air handling system to supply conditioned outside air to the critical rooms.
- Exhaust systems for battery hydrogen gas exhaust will be included in the design.
- Design per current NSTD385.

Fire Protection

- Fire Suppression and Detection services for building expansion to meet NSTD386.
- Detection; Clean Agent Suppression and Sprinklers as identified in the Verizon AC UPS Network Space High Density Application Basis of Design.

Electrical

- New two 4,000A utility service via a 2,500kva pad-mount (Utility).
- Three (3) – 600 kW / 600 KVA AC UPS modules per A&B sides to power the Network Equipment. Day one only two systems and one future each side.
- Batteries for maximum 500kW load per UPS and a maximum 600kW limit per UPS module.
- 'N+1' 3MW Diesel Generators with 12,000-gallon belly tanks in configured with Verizon "cross-over" ATS scheme. One Generator to be installed as 'Day One' equipment.
- Each UPS module is to serve two (2) 300KVA PDUs (A and B) and serve a single Hot Aisle with an RPP at each end.