Electrical Project Overview

The James H. Quillen VA Medical Center is in Johnson City, Tennessee and is part of the Veterans Integrated Service Network 9 (VISN 9.) On this station is building 77, which houses the main computer room (MCR). This room services the telecommunications requirements for the hospital buildings.

The James H. Quillen VA Medical Center has a requirement to design a project to construct a new MCR. This replacement will require electrical supporting design.

Existing System Description

Normal power for building 77 originates from “PMT-27-M77B”, a 1250kVA, 12.47kV - 480Y/277V, 3ph, 4W pad mounted transformer located adjacent to building 77. This service transformer feeds 1600A 480V switchgear M-77-0-B located in Room L001A of Building 204. Emergency power for building 77 is served from an existing 1100kVA, 480Y/277V, 3ph, 4W engine generator located in an unmarked outbuilding across the street from building 204. Emergency power switchgear “77-204-XSB” is located in Room L169 of building 204. An existing 350kVA UPS and distribution PDUs feed the existing MCR.

Existing equipment will be protected and maintained for parallel operation with new work for the duration of the switch-over process. Upon successful switch-over existing MCR and equipment are to be abandoned in place for future demolition.

Selective Demolition

The new space selected to become the MCR, room 3A112, currently is an existing office and IRM room. These rooms will have all existing receptacles, lighting, lighting controls, and conduit demolished and removed from the space. Continuity of circuits that feed loads outside of the new MCR space will be protected.

It is anticipated that the contractor will be able to access wireways/conduits in the interstitial platforms, walls, or ceiling plenum to remove existing circuits.

Ultimate Design Capacity

Following the completion of the equipment layout and selection of design criteria–driven basis-of-design equipment, calculations identified a projected telecommunications load of 90 kW. To adequately support this load, the basis of design includes a 100 kW UPS system. The overall design has been coordinated across all disciplines around two 100 kW UPS systems to provide redundancy and ensure

capacity for the 90 kW telecommunications load. The ultimate design capacity of the MCR will be 100 kW.
Battery selections have been made to provide a 10-minute run-time.

UPS System Description

New equipment including ATSs, UPSs, transformers and panelboards will be provided for the construction of a new MCR to run parallel to the existing MCR. New equipment will be provided so that a redundancy level of 2N is achieved. New mechanical loads that feed the new MCR will be provided with the necessary feeds and equipment to ensure proper electrical support.

For the purpose of providing 2N redundancy to the new MCR, a second source of normal power will be taken from SWBD MSB-204-A a 1600A switchboard in room L169 of building 204. MSB-204-A and M-77-0-B will feed two branches, A and B. These branches will include all required equipment for 2N redundancy of the feed to the MCR. These branches will each feed the MCR IT equipment through 2 UPS systems MCR UPS A and MCR UPS B. These UPS systems will each feed corresponding A an B distribution panels UPS-A and UPS-B. These distribution panels each feed two corresponding A and B branch busways. These busways will be specified to be of Starline make.

Since the existing MCR is to be abandoned in place after a switch-over process, it is not anticipated that any capacity issues will be had with emergency power equipment, nor other existing power infrastructure. This is the case because the new MCR loads and systems are identical to or smaller in demand than existing equipment.

For safety, an emergency power off (EPO) system will be installed. This EPO system will be provided with relays to shunt trip breakers so that all MCR INCOMPLETE SENTENCE??

Building Lighting Systems

MCR lighting for the revised space will consist of chain-mounted, low bay style fixtures with LED light sources with integral lamps and drivers. Drivers will be a minimum of 85% efficient at full load, have a power factor greater than 95%, total harmonic distortion less than 20%, and operate with a universal 120/277V input. All lights will be serviceable from below the ceiling. Emergency lighting fixtures along the path of egress will be served from Life Safety branch of emergency power system.

Self-contained emergency lighting units will consist of lamp heads, batteries, battery charger, and an integral test switch. Batteries will be nickel-cadmium and rated to operate for a minimum of 90 minutes.

Exit signs will be provided as required along the path of egress. Fixtures will be universal mount, single/double-faced with directional arrows as required. Fixtures will be red LED type with brushed aluminum finish and connected to the Life Safety Branch panelboard.

Commissioning

The system will be commissioned subject to the requirement of Section 01 91 00 General Commissioning Requirements

ELECTRICAL CODES AND STANDARDS

A. Americans with Disabilities Act

B. Architectural Barriers Act (ABA) Standards 2015

C. VA PG-18-13 VA Barrier Free Design Standard 2018 (supplement to aba standards)

D. ASHRAE Standard 90.1-2022 – Energy Standard for Buildings Except Low Rise Residential Buildings

E. IBC 2024 – International Building Code

F. IEBC 2024 – International Existing Building Code

G. IECC 2024 – International Energy Conservation Code

H. NFPA 70-2023 - National Electrical Code (NEC)

I. VA PG-18-10 Electrical Design Manual, December 2019

J. VA Physical Security & Resiliency Design Manual 2020 (1 June 25 Revision)

Electrical Calculations

Relevant voltage drop, lighting, load and MCR load calculations have been completed and are included in this submission. SKM plot, AIC Ratings, load calcs and MCR calculations are included in the submittal documents or on submission sheets.

END DIVISION 26