Carolina Engineering Solutions, LLC

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Electrical Design Narrative for
Fountain Inn High School Addition
Greenville School District

The following information will outline, in general terms, the overall effort required for the electrical installation of the new addition at Fountain Inn HS. The electrical design will be based on the latest version of the Greenville School District Design Guide. The electrical systems are broken down into multiple categories and are outlined in some level of detail, depending on the information available to us currently. Any part of the information contained in this narrative is subject to change prior to detailed construction documents.

Normal Power Electrical System

Service to the new addition will derive from the existing main switchboard and will supply electrical distribution and lighting panels located in electrical rooms serving specific areas of the new addition. These panels will supply 480 and 277 volt normal power to the required equipment and interior lighting within those areas. The panels will also feed 480-208/120V transformers needed for the required 120 volt normal equipment loads and "K" rated transformers for the computer/data systems isolated ground receptacles.

Additional panels will be required on each level to achieve the measurement and verification as requested by the school district. The additional panels will segregate all mechanical, lighting, and receptacle loads per floor.

Emergency System

The emergency system will be served from the schools existing generator life safety and equipment branch distribution system. Panels will supply 277 volt lighting loads throughout the building to satisfy emergency egress lighting requirements. The panels will also supply 480-208/120 volt transformers needed for the 120 volt emergency circuits and receptacles serving equipment such as fire alarm, data servers, telephone systems, and other loads deemed necessary as outlined in the Design Guide.

Mechanical Equipment Power Distribution

Power distribution to HVAC equipment will be supplied by way of the respective distribution panels located throughout the facility. Areas with larger, more concentrated mechanical loads may require dedicated HVAC equipment electrical panels. Power will be supplied to all mechanical control panels as required for the integrated building management system. Power and control requirements for HVAC equipment will be closely coordinated with the mechanical engineer.

8 West McBee Avenue, Suite 203, Greenville, South Carolina 29601
Phone: (864) 370-9355 • Fax: (864) 370-9505 • Website: www.carolinaengr.com

Convenience and Task Receptacles

Receptacles will be located throughout the building as required for the specific areas. All receptacles installed will be specification grade type. In office, administrative and utility areas, an average of one (1) receptacle per wall will be installed. Receptacles will be installed and wired as required for all specific pieces of equipment such as fax machines, copiers and vending machines. In full size classroom areas, a minimum of (9) receptacles will be provided throughout the room with at least (2) located on each wall (not including computer workstation outlets) per OSF Design Requirements. Special use classrooms such as home science laboratories or areas with equipment will have emergency stop devices to de-energize room outlets in case of emergency. House keeping outlets will be installed 25' or less apart in all corridors. GFI/WP receptacles will be provided at the required locations on the building exterior for HVAC equipment service and for the owner's use as needed. GFI receptacles will be installed at above counter heights in all bathrooms. Isolated ground receptacles, served by isolated ground transformers and panels, will be installed, and wired in the classrooms and administrative areas for all computer workstations.

Interior Lighting Systems

Most interior lighting will be 277 volt, utilizing energy efficient LED fixtures. The majority of the building will be illuminated using 2'x4' recessed fixtures with center shields. Glare reducing fixtures that meet RP-1 Level 1 compliance will be utilized in areas such as computer laboratories or areas with a high concentration of computers. The fixtures will be laid out in all areas to achieve the recommended lighting levels as established by the Design Guide and Illuminating Engineering Society (IES) for the specific areas. Ashrae 90.1 requirements will be strictly adhered to in all aspects of the lighting design.

Digital lighting controls will match the existing controls configuration with room controllers, occupancy sensors, dimming, and in classroom teacher desk control. All classroom and office areas will be provided with wall dimmers to achieve the lighting reduction required by Ashrae 90.1. Corridors and restrooms will utilize ceiling mounted ultrasonic sensors spaced appropriately.

Emergency egress lighting will be supplied by the emergency system. Specific light fixtures will be selected throughout the building to provide the required emergency light levels in the paths of egress and other areas where emergency lighting must be present. Fixtures in classrooms and other areas that are not part of the school core will be provided with generator transfer devices.

Exterior Lighting Systems

Pole mounted area luminaries will be installed in all parking lots and roadways leading onto the site. The fixtures will utilize energy efficient, LED lighting. Pole heights, fixture quantities and spacing will be designed for maximum performance and efficiency. Parking lots and drives will be illuminated to at least the minimum IES standards for the application.

Entrances into the building will be illuminated by building mounted lighting as required. Wall mounted LED area lights will be installed in proper locations on building perimeter for adequate security lighting. Building exterior accent lighting may be installed in certain areas for beautification and security.

Building mounted fixtures shall be controlled solely by photocell. Area site lighting fixtures shall be activated by a centralized photocell and deactivated by the building management system with override capability.

Fire Alarm System

The existing voice evacuation Fire Alarm panel system will be upgraded as required and additional Notification Appliance Panels added to support the new addition. Audio and visual indicating devices will be installed to provide the required coverage for alarm notification for students, staff and the public. The system will be powered by the emergency power system to ensure proper operation during power outages.

Interior Voice and Data

Data/voice communications will be provided throughout the new addition utilizing a VOIP distribution network. Fiber routes will be established from MDF to the IDF closets. The horizontal distribution network will utilize Cat6 communication cabling. Data/voice outlets will be located throughout the addition at locations designated by the Design Guide. All wiring for this system will be distributed throughout the school utilizing cable tray.

Wireless Access Points will be situated in each classroom and other areas as defined by the Design Guide. Cat6A cabling will be utilized for the Access Points.

Intercom System

The existing intercom system will be upgraded as required and tied into for the new addition. Intercom paging will be installed in all areas except for storage and low use areas. Each classroom will have call-in capability via push-to-call stations located at the doorways. Intercom cabling will be installed in cable tray.

Television Over Internet System

Television locations as dictated by the Design Guide will be in the new addition. Cat6 cabling will be used utilizing cable tray distribution.

Security System

Security system passive infrared detectors will be located in the new addition rooms and areas accessible from lower-level exterior doors and windows. Devices will be tied into the existing main security panel. All wiring for this system will be distributed throughout the school utilizing cable tray.

Card Access System

Card Readers will be located per the owner's direction and connected to the existing Card Access system. All wiring for this system will be distributed throughout the school utilizing cable tray.

Closed Circuit Television (CCTV) System

IP based CCTV cameras will be located per the design guide and connect into the local IDF closets accordingly. Interior cameras will use Cat6 and Exterior cameras will use multi-mode fiber and media converters. Cabling will be distributed via cable tray.