



Executive Summary

Technical Report 2 is an analysis of the existing electrical building systems and the associated connected loads. The Center for Health Research and Rural Advocacy (CHRRRA) is part of the Geisinger Health System Campus, which already has an existing 12.47KV aerial service from PPL Co Electric. The CHRRRA building taps into the dual radial feed extending from the main switchboard in the plant engineering substation room to transformers A, B, M, and S. Transformer S is located in the Weis Research Center which is directly adjacent to CHRRRA; therefore, service is tapped from transformer 'S' before step down, and is routed to the CHRRRA building through (1) existing and (2) new manholes.

After the service enters the building at the lower level electrical substation room, transformer '17' in switchgear '17' steps down the 12.47KV service to 480Y/277V. This voltage feeds all motor and HVAC equipment loads in the building. The voltage is then further stepped down by smaller transformers to 208Y/120V. This voltage feeds all lighting loads, receptacles, and appliance loads in the building.

CHRRRA also has a new 1250KW diesel fuel emergency generator located on the lower level of the building that feeds the motor control center, the (3) 500 ton chillers, and the life safety for both CHRRRA and the Weis Research Center. During construction, the emergency loads from CHRRRA will be connected to the existing emergency generator located in the Weis Research Center. The coordination of load between the two generators will be critical in the installation process.

The 60,000 sq ft building has four floors with one lighting panel for each floor. Dimming panels and relay panels are incorporated into the lighting control system for added versatility in areas such as the auditorium, multipurpose room, and open office. Coordinated with the lighting control panels are photocells and astronomical timers which control the lighting settings depending on the level of daylight in the space and the time of day.

After compiling the NEC design load calculations for all electrical loads off of the main switchboard, it became clear that the current wire sizes were not sized for NEC lighting loads. NEC requires a 3.5 VA/sq ft be used for office lighting load when sizing conductors. This value was not used in the original design possibly because CHRRRA is a green building and would never use such high VA levels for its lighting system. Besides the lighting load discrepancy, all wire sizes were ample for the NEC design loads.

CHRRRA also has a voice copper and fiber service along with two data fiber services. The voice/data communication system includes voice/data outlets, telephone outlets, podium floor boxes, floor boxes in conference rooms for video outlets, and junction boxes for voice/data at the office cubicles. The building has a fire protection system, which includes a wet standpipe system in each stair tower along with a sprinkler system which covers all main public spaces.