

ELECTRICAL SYSTEMS ASSESSMENT

Hanover High School

ELECTRICAL DISTRIBUTION SYSTEM:

- ?? The existing electrical service consists of an underground primary service originating at a utility pole on Cedar Street, then to a pole on the property in parking lot. The primary service enters the building underground into a transformer vault. This vault, accessible to the utility company only, houses a transformer used to step down the voltage to 120/208, 3 phase, 4 wire.
- ?? The secondary service consists of a 3000A, 120/240V, 1 ϕ , 3 w, fully enclosed wireway between the transformer vault and terminates on a 3000A (3) section switchboard consisting of a main/C/T section and (2) distribution sections. The switchboard was manufactured by ITE and does not have mounting space for additional breakers.
- ?? The facility is master metered on the secondary side. The meter is located on the utility pole.
- ?? The switchboard has rear access.
- ?? The remote panelboards are generally fed from the switchboard. Most panels are located in storage closets, offices and classrooms.
- ?? A spot check of the demand load indicated less than 300 amperes.
- ?? In general, the existing switchgear is of the original vintage.

GENERAL WIRING:

- ?? General building wiring consists of mainly pipe and wire for power, lighting and fire alarm. Security wiring and other low tension wiring is not installed in conduit. Above ceiling wiring is not confirmed but believed to be piped.

EXTERIOR LIGHTING:

- ?? Exterior lighting is adequate and consists of mainly pole mounted MH on utility poles.
- ?? There are no building mounted security lights with the exception of an occasional fixture at entrance doors.
- ?? Exterior lighting control panel is completely rotted due to water damage.

INTERIOR LIGHTING:

- ?? Interior lighting is a mixture of 1, 2, 4, and U lamp fluorescent lensed fixtures in corridors. Fixtures are generally locally switched.
- ?? (2) rows of 1' x 4' lamp wraparound fixtures in classrooms. Classrooms are dual switched, (1) switch per row.
- ?? (2) rows of suspended (2) lamp T8 fluorescent fixtures in shop area.
- ?? Acrylic lensed 2' x 2' surface mounted vapor tight fixtures in kitchen.
- ?? 2' x 4' surface mounted 4 lamp fixtures in cafetorium.
- ?? 1' x 4' 2 lamp wraparounds in locker rooms.
- ?? 1' x 4' 2 lamp vapor tight wraparounds in shower (some damaged).
- ?? Recessed 2' x 4' 3 lamp fluorescent down lights in toilets.
- ?? Solid reflector, suspended metal halide high bays with open bottom with wire guard in Gym. Fixtures are breaker controlled from local panelboards. Incandescent lamps in similar fixtures in gym are powered from the emergency battery system.
- ?? Parabolic 2 lamp, 30 watt fixtures in auditorium.
- ?? Spot and stage lighting with control panel in stage area (Scrimmer II system).
- ?? Scoreboard and local PA systems are located in gym.

EMERGENCY LIGHTING SYSTEM:

- ?? The existing emergency lighting system is via an emergency battery rack in electric room. The system provides 120 volt emergency power.
- ?? Battery rack is corroded with many of the cells dry of battery acid .

FIRE ALARM SYSTEM:

- ?? The fire alarm control panel is located in the Main Office with digital dialer. The system is an Edwards EDT2 system.

- ?? A remote annunciator exists in the corridor of main entrance.
- ?? Manual pull stations are located throughout the facility, some are flush and some are surface mounted.
- ?? Horn/strobe signals are also located throughout the building. Units are generally surface mounted on block walls.
- ?? A knox box (key box) is located outside the main vestibule.
- ?? Ceiling smoke and heat detectors were observed.
- ?? Fire alarm wiring in general appears to be in EMT (conduit).
- ?? Magnetic door holders were not observed.
- ?? Duct smoke detectors were not observed.

SECURITY SYSTEM:

- ?? The security system consists mainly of motion detectors in corridors
- ?? Magnetic door contacts exist at frequently used exterior doors.
- ?? The security control panel is located in the main office.

GENERAL POWER:

- ?? Receptacles are minimally located throughout the facility and generally flush mounted on the existing block walls or surface mounted and piped.
- ?? A typical classroom consists of (3-4) duplex receptacles, for teaching wall and computers.
- ? Simplex clock control system upgrade approximately 5 years \pm .
- ? Multicom 2000 intercom system through telephone.

GENERAL ASSESSMENT:

- ?? Most of the electrical systems with the exception of fire alarm system, are of the original vintage, 1964 and are generally in fair to poor condition. These systems, although generally functioning, have run their course and range from obsolete to approximating the end of their useful life span. We recommend the replacement of all systems.

RECOMMENDATIONS

ELECTRICAL DISTRIBUTION SYSTEM:

- ?? The existing service is rated at 3000 amperes at 120/208 V, 3 ϕ , 4 wire or 1080 kva total. Based on 116,375 s.f., 9.0 watts per s.f. are available.
- ?? Today's school, with heavy computer usage and depending on how much space becomes air conditioned, generally would be sized for a minimum 10 watts/s.f. demand.
- ?? This school would probably benefit from a 277/480 V, 3 ϕ , 4 wire service.

GENERAL WIRING:

- ?? The existing wiring although generally in pipe would not be suitable for reuse.
- ?? We recommend all new wiring and conduits and complete removal of the existing system wiring. The new wiring method would be pipe and wire with metal clad, MC cable, where concealed. A system of surface raceways equal to wiremold is recommended when exposed in finished spaces.

INTERIOR LIGHTING SYSTEM:

- ?? The existing lighting is in general at the end of its life.
- ?? We recommend suspended predominantly indirect luminaires in classrooms with electronic ballasts and Octron T8 fluorescent lamps.
- ?? 2' x 4' prismatic lensed fixtures in corridors and other utility spaces.
- ?? 2' x 4' parabolic fixtures with low glare louvers in offices.
- ?? Suspended Metal Halide high bays with prismatic acrylic reflectors for the Gym with quartz restrike as required.
- ?? Suspended Metal Halide luminaires equal to Holophane for the Cafetorium. Also a supplemental layer of incandescent suspended dimmable cylinders during performances and also theatrical fixtures for the platform/stage.

EXTERIOR LIGHTING SYSTEM:

- ?? New pole mounted cut-off luminaries of the Metal Halide source are recommended for parking areas and roadways/walkways. Building mounted perimeter fixtures should also be installed for security and illuminating entrances, etc..

EMERGENCY SYSTEM AND EXIT SIGNS:

- ?? The existing emergency systems are in violation of today's codes. New emergency systems are required to be entirely separated with 2 hour rated enclosures and with fire rated feeders as well as dedicated fuel sources.
- ?? We recommend a new generator either diesel or natural gas fired. The generator could be exterior mounted within a weatherproof sound attenuated enclosure or interior in a dedicated rated room. A system of new automatic transfer switches and panelboards would be provided.
- ?? Emergency lighting will be via a selected number of the same general luminaries.
- ?? Exit signs would be of the long life energy efficient LED type.
- ?? In addition to life safety functions the generator would be sized for a selected number of heating apparatus (freeze protection), kitchen freezers and coolers, lift, and other civil defense functions if so desired.

FIRE ALARM SYSTEM:

- ?? The existing system is newly installed and seems to be code compliant.

SECURITY SYSTEM:

- ?? An addressable perimeter security system with a control panel with dialer and battery backup and keypads strategically located throughout the facility should be provided. All exterior doors should be monitored. All grade level rooms with windows and corridors would have motion sensors. System should interface with lighting system to automatically turn on corridor lights upon alarm.

SOUND/PAGING, TELEPHONE/DATA, CLOCK AND CATV:

- ?? Refer to technology consultants report.

CLOSED CIRCUIT TV (CCTV) SYSTEM:

- ?? The closed circuit TV system should consist of a matrix switcher with inputs as required. Cameras should be provided on interior at main entrances and exterior as required within weatherproof enclosures. The head end equipment should consist of monitors and digital video recorders.

GENERAL POWER:

- ?? A system of computer grade panelboards with surge attenuators should be provided for the technology and other sensitive systems.
- ?? Receptacles will be provided to adequately support a modern day school facility.