

EXECUTIVE SUMMARY

The original building was constructed in 1958 with a major addition constructed in 1967. Most of the systems are original to the building and although functioning, have outlived its intended useful life. The facility's two electrical services are provided by National Grid and are secondary metered. Other incoming utilities include telephone, cable TV, and fiber.

The power distribution system is original and in fair to poor condition. Most of the lighting systems have been retrofitted with new T8 lamps and electronic ballasts, but most light switches and wiring were reused. The fire alarm system has been upgraded however the system wiring was re-used. System coverage is generally adequate; however, the audible devices consist of horns in lieu of speakers.

The emergency standby system is inadequately sized, in poor condition, and due to code changes, is no longer code compliant.

The existing communications, intercom, and security systems are minimal and should be replaced with state-of-the-art integrated systems.

We recommend replacement of the Electrical and Communications/Security systems under a renovation program.

Power Distribution System:

Three phase primary service runs overhead on building side of street where it tees off into the site. Overhead primary continues on site over four pole spans where it transitions to underground at two locations, Pole # 66-2 and Pole# 66-4.



1: Tee-Off Pole at Site

2: Overhead Services through Site

The school is serviced by two electrical services; service #1 feeds the 1958 building, while Service #2 feeds the 1967 building. Service #1 primary originates at Pole# 66 -2 where it runs underground in one 4" conduit into a transformer vault. The vault has exterior access to national grid only. Secondary service originates in the vault and runs overhead to an unlabeled switchboard manufactured by the Kelek Co. The switchboard is rated at 120/208 V, 3Ø, 4W and is located in the boiler room.

The switchboard has a C/T and main disconnect section and a breaker distribution section. The electric meter is located adjacent to switchboard.

3: 1958 Switchboard

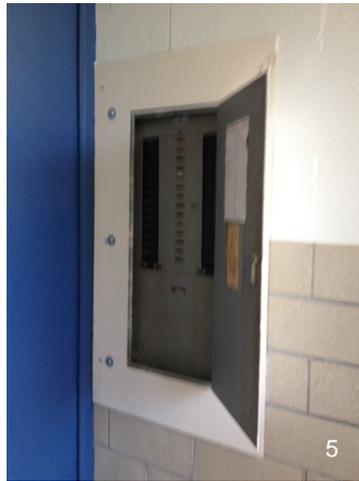


Gas service pipes run directly above the switchboard.

4: Gas Pipe of Switchboard



Most panelboards are original KeLek Co., while others are newer Siemens and GE. Panelboards are of the break type located throughout the facility. Most panels are generally full and in poor condition.



5: Corridor Flush Panel

Service # 2 primarily originates on Pole # 66-4, where it runs underground in one 4" conduit to an exterior pad-mounted transformer: concealed by trees and shrubs. Secondary service runs underground between the transformer and a 4,000 Ampere, 277/480V, 3Ø, 4W switchboard located in the electrical room on the second floor.



6: Shop Panel

7: Pad-Mounted Transformer

The switchboard, manufactured by Westinghouse, is master-metered with a 4,000 Amp, main disconnect C/T section. In addition, the switchboard is split into three sub main disconnects C/T sections each separately metered as follows: one 3,000 amp for electric heat, one 800 amp for general light and power, and one 600 amp for electric hot water.

8: 1967 Switchboard



9: Meters



The switchboard mains and distribution branches as well as local distribution panels are of the fusible type. Branch panelboards located throughout the facility are of the breaker type.

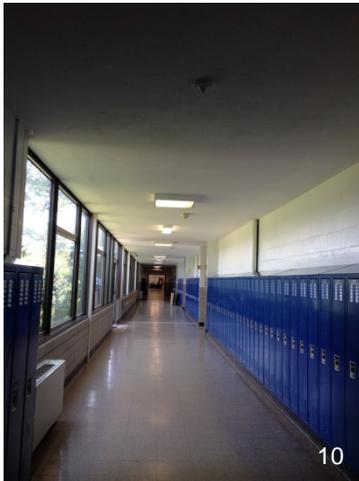
The switchgear manufactured by Westinghouse is original and is in fair condition. A fusible switch has been mounted to the top of the board due to lack of mounting space. The switch is not readily accessible. The electric room and switchgear layout do not meet current codes which require doors to swing out and provided with panic hardware.

In general, most switchgear is original to building ranging in age from 48 years to 57 years old. Condition ranges from fair to poor. The rating of both electric services reflects original electric heat which has been converted to natural gas. Thus, the switchgear due to its age and condition should be replaced under a renovation program with a single electrical service.

INTERIOR LIGHTING

The lighting has been retrofitted with T8 lamps and electronic ballasts. Corridor lighting consists of surface and recessed 2X2 troffers with acrylic lens with 2 UT8 Corridor daylight monitor areas have wall cylinders with Halogen Lamps. Corridor lighting is controlled with local switches except for efficiency lights.

Typical classroom has 2X4 recessed troffers with acrylic lens and three T8 lamps. Lights are controlled with a single switch and occupancy sensor.



10: Surface Corridor Fixtures



11: Recessed Corridor Fixtures

A-10



12: Corridor Monitors

Other spaces including cafeteria, kitchen, and offices have recessed 2X4 troffers with three T8 lamps.

13: Classroom Lights



14: Cafeteria Lights



Shops have continuous rows of industrial strips with two T8 lamps with sleeves.

The gym has 2X4 fluorescent high bays with four T5HO lamps with lens and wire guard. Gym fixtures have integral occupancy sensors.

Auditorium house lighting consists of recessed down lights with halogen lamps controlled with wall dimmers located on stage. Performance lighting consists of one row of border lights on stage and three dual par lamp holders on front of house. Performance lights are breaker controlled from panel board located at stage. Stage work lights consist of 2X4 recessed troffers.

15: Gym Fixtures



16: Wall Dimmers on Stage



Kitchen hood has globes without guards with compact fluorescent lamps. The switch is on the hood and is not ADA accessible.

The interior lighting has been retrofitted and most lighting is in fair to good condition. The existing wiring and controls were re-used.

The facility does not have an automated lighting control system.

Lighting is functional with most spaces adequately lit; however, most lights are of utility grade.

Under a renovation program, the lights should be replaced with LED sources.

EXTERIOR LIGHTING

The exterior lighting consists of HID floods on utility wooden poles at rear parking areas and grassy area.



17: Flood on Utility Pole

The front parking area is lit with high pressure sodium cobra heads on concrete poles. Canopy has non-functional fluorescent strips abandoned in place.



18: Cobra Head on Concrete Pole

Building perimeter has HID wall packs with integral photocells. Entrance canopy has recessed cans with drop lens.

Exterior lighting is not of the cut-off type. Various fixtures were on during daylight.

19: Cobra Head on
Concrete Pole



In general, exterior lighting is not energy efficient and provides inadequate lighting. The exterior lighting should be replaced with LED cut-off luminaires and controlled with photocell “ON”, timed off.

The tennis courts and baseball field are not lit.

Basketball courts are lit with 2 poles fed directly from the street, separately metered. A Musco NEMA 3R cabinet houses the panel and controls.

EMERGENCY STANDBY SYSTEM

The 1967 building has a 25kw, 120/208V, 3Ø, 4W natural gas generator. The generator is a Kohler #30R629104A and is in poor condition. One 100 Amp Zenith automatic transfer switch is located in same room. The generator and transfer switch share the same room with the water heaters. An extension cord runs on the floor used to charge the batteries.



There is no emergency lighting on exterior doors. Exit signs have compact fluorescent lamps; some exit signs are not lit, including the Gym and Auditorium.



21: Gym Exit not lit

Exit signs are not energy efficient and coverage is inadequate in many spaces.

Battery operated remote heads are used for egress lighting in the 1958 building.

*22: Remote Emergency
Lights*



Gym emergency heads have wireguards.

The emergency system is original and inadequately sized, and is not code compliant.

The emergency system should be replaced with a code compliant system.

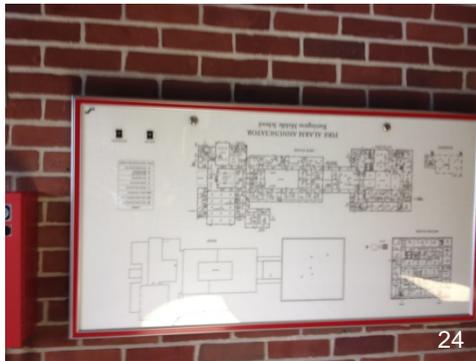
FIRE ALARM SYSTEM

The fire alarm system for the facility consists of a newer replacement Notifier 3030 panel located in the Main Lobby. A graphic LED annunciator is located adjacent to FACP. The form of alarm transmission is via a Sigcom radio box.

The audible devices consist of horns. The visual devices are ADA compliant. Coverage appears fair. Smoke detectors exist in corridors, classrooms, stairwells, and most spaces. Heats exist in kitchen, boiler room, and home economics. Smokes in Gym have wire guards. The Auditorium has (2) smokes. The kitchen hood does not have a fire suppression system.



23: Fire Alarm Panel



24: Annunciator



25: Horn/Strobe Unit

Pull stations generally exist at exterior doors. Corridor doors have magnetic door holders. Stairwell doors are held open with wooden blocks.

Typical single toilet room does not have a strobe.

The fire alarm system, although recently upgraded, does not have voice evacuation, which is currently required by code.

COMMUNICATIONS/SECURITY/MISCELLANEOUS

Telephone, Cable TV, and fiber enter the building overhead.

The telephone system is a Toshiba IP-CRSUB672A business communication system rack mounted in the IT room.

The data cabling infrastructure is generally CAT5. Typical IDF communications racks are located throughout the school interconnected with CAT5 cabling. Racks are not located within conditioned dedicated rooms. Wireless access nodes exist throughout school. Typical classroom has one data outlet.



26: IT Rack

The paging system console, located in the main office, is a Bogen model SBA-225 with microphone. Paging is through a desktop digital telephone handset. Paging speakers exist throughout the school.

Each classroom has a wall-mounted call-in switch and wall speaker to communicate with the Main Office. The call-in switch is located at 5' above floor which exceed ADA.



27: Intercom Console



28: Clock/Speaker Call-In Switch

The Gymnasium, Cafeteria, and Auditorium have local sound systems.

The Simplex 2400 master clock system controller is located in the Main Office, but is not functional. A battery operated clock is located in each classroom.



29: Clock Controller

There is an Aiphone video/intercom station at the Main Entrance door with a door release console Aiphone JK-IMD at the Main Office.



30: Door Intercom

A keyscan card access proximity system exists with readers including at the main entrance door.

A Pelco closed circuit TV system with a Samsung digital video recorder 16 channel, #SHR-6162 exists in the IT room.

The facility does not have a lightning protection system.

The receptacle coverage is inadequate in most spaces. Typical classroom has one duplex receptacle per wall. Extension cords were used throughout Classrooms and Kitchen. The use of extension cords for permanent wiring is a code violation. Kitchen receptacles are not GFI protected. Certain floor receptacles in the kitchen and former kitchen are a trip hazard.

Various receptacles near sinks are not GFI type.

There is no emergency power off device in the Kitchen to kill power to equipment.

Boiler Rooms do not have emergency power off, EPO stations at doors to kill power to boilers during an emergency.

The facility does not have a bi-directional antenna system used to enhance communications with portable radios by First Responders.

RECOMMENDATIONS

MAIN DISTRIBUTION SYSTEM

The existing electrical services should be upgraded with a single 277/480 volt system to provide the required capacity for the building load based on 10 watts per square foot power consumption. A new pad-mounted transformer with new underground primary and secondary services should be provided. The vault-mounted and pad-mounted transformers would be removed when no longer needed.

The proposed secondary switchgear should be installed in a dedicated main electric room, and sized in accordance with current NEC minimum workspace requirements. New panelboards should be added as required. The new panelboards should be located in electrical rooms located in each wing of the building. The electrical rooms should be sized in accordance with current NEC minimum workspace requirements and provide space for future expansion.

Computer grade panelboards with double neutrals and with surge protective devices should be provided for computer receptacles to mitigate harmonic distortion of non-linear computer loads.

Additional duplex receptacles for general purpose power should be provided throughout the facility as required. Additional duplex receptacles for computer workstations in classrooms/labs should be installed and circuited to the computer grade panelboards outlined above.

Each classroom should have a minimum of 2 duplex receptacles per teaching wall and 2 double duplex receptacles on dedicated circuits at classroom computer workstations. The Teacher's workstation should have a double duplex receptacle also on a dedicated circuit.

Office areas will generally have 1 duplex outlet per wall. At each workstation a double duplex receptacle will be provided.

Corridors should have a cleaning receptacle at approximately 30-40 foot intervals.

Exterior weatherproof GFI receptacles will be installed at exterior doors.

EMERGENCY DISTRIBUTION SYSTEM

Provide a new exterior emergency generator and automatic transfer switches to provide emergency backup power for life safety and essential standby loads (i.e.; freezers, communications and security equipment, boilers, pumps, etc.) Dedicated 2-hour fire rated emergency rooms shall be provided within the building. Life safety system will feed all code required egress lighting and exit signs.

Emergency life safety lighting should be provided in toilet areas and other public spaces as required by NFPA 101 Life Safety Code.

LIGHTING SYSTEM

In general, the existing lighting system should be upgraded as required based on the proposed architectural renovations.

Classroom lighting fixtures will consist of recessed or pendant-mounted direct/indirect fluorescent luminaries with LED lamps and electronic drivers. The fixtures will be pre-wired for automatic dimming control where natural daylight is available and also for multi-level switching. Occupancy and dimming sensors will be provided.

Office lighting fixtures will consist of acrylic recessed direct fixtures with LED lamps and electronic drivers for dual-level switching. Fully dimmable drivers will be provided where natural daylight is available. Lighting levels will be approximately 30 foot candles in classrooms and offices.

Cafeteria and Auditorium lighting will be upgraded with LED sources and electronic drivers. Theatrical lights with a dimming system will be provided for performances. Gym lighting could be reused.

Corridor lighting will be comprised of recessed acrylic fixtures with LED lamps and electronic drivers. The corridor light level will be designed for approximately 20-foot candles.

Kitchen and Seryery lighting will consist of surface 2'x4' acrylic lensed troffers with aluminum frame doors with LED lamps and electronic drivers. Light levels will be approximately 50-75 foot candles.

Each area will be locally switched and designed for multi-level controls. Each classroom, office space and toilet room will have an occupancy sensor to turn lights off when unoccupied. Daylight sensors will be installed in each classroom and perimeter spaces for automatic dimming of light fixtures.

The entire school will be controlled with an automatic lighting control system using addressable networked controls for programming lights on and off.

Exterior site lighting fixtures for area lighting will be pole mounted long life, energy efficient LED luminaries in the parking areas. Building perimeter fixtures will be wall mounted LED over exterior doors. The exterior lighting will be connected to the automatic lighting control system

for photocell on and timed off operation. All exterior lighting will be of the cut-off type.

FIRE ALARM SYSTEM

The fire alarm and detection system could be re-used and expanded. It is recommended that the horns be replaced with voice evacuation speakers. The system is of the addressable type where each device will be identified at the control panel and remote annunciator by device type and location to facilitate search for origin of alarms. Smoke detectors will be provided in open areas, corridors, and other egress ways. The sprinkler system will be supervised for water flow and tampering with valves. Voice evacuation speaker/strobes would be provided in egress ways, classrooms, assembly spaces, open areas and other large spaces.

Strobe only units will be provided in single toilets and conference rooms. Manual pull stations will be provided at exit discharge doors.

The system will be remotely connected to automatically report alarms to fire department via the radio master box.

UNINTERRUPTABLE POWER SYSTEM (UPS)

A three phase centralized Uninterruptible Power Supply (UPS) system should be provided with battery backup. The system will provide conditioned power to sensitive electronic loads and telecommunication systems to bridge over power interruptions of short duration and allow an orderly shutdown of servers during a prolonged power outage. The UPS system will also be connected to the stand-by generator.

LIGHTNING PROTECTION SYSTEM

A system of lightning protection should be provided. The system will be installed in compliance with the provisions of the latest "Code for Protection Against Lightning" for buildings as adopted by the National Fire Protection Association and the Underwriters' Laboratories, Inc. for a UL Master Label System. The lightning protection equipment will include air terminals, conductors, conduits, fasteners, connectors, ground rods, etc.

SECURITY/COMMUNICATIONS

A new addressable security system using motion detectors on all perimeter rooms on the first level and all corridors on each level is recommended. Each exterior door will have door contacts for monitoring door position and security keypads provided at each major entry point to the facility. An integrated CCTV and access control system should be provided with building mounted IP cameras covering the perimeter of the building and each major entrance. Card readers should be provided at major entrances to the building.

The existing classroom intercom system should be replaced with a state of the art intercom system with web based software. Each classroom

should be wired back as an individual home run for private conversations. New speakers should be located throughout the facility to ensure adequate coverage and capable of flexible selective zone paging. The existing master clock system should be replaced with a new GPS based wireless master clock system with repeaters in the IDF closets and 120V wireless secondary clocks located in each classroom, office, and large space as needed.

Tel/Data wiring should be replaced with CAT6 plenum rated cable throughout. New outlet locations should be reviewed to accommodate the facilities new technology equipment plan. A new head end room with 50 micron laser optimized multimode and single mode cable to remote dedicated IDF rooms should be provided for gigabit connectivity to the desktop. The new dedicated data closets will ensure that present and future data needs are accommodated.

The classroom A/V infrastructure should be updated to accommodate the need for A/V equipment as well as future equipment to be installed in the next few years. This would include wall mounted projection and box/conduit provisions for updated local sound systems. The local sound system in the large spaces including the gymnasium, cafeteria, and auditorium should be replaced or provided with new up-to-date systems.