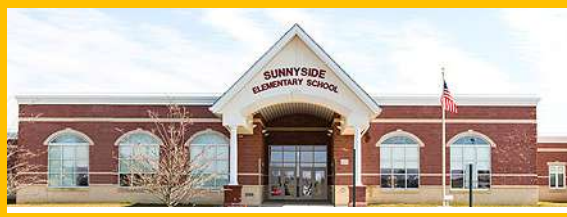
SUNNYSIDE
Elementary School



Certificate of Necessity

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CONSULTING ENGINEERS

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Project No.: 18047
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SMYRNA
School District

CONTENTS

1 EXECUTIVE SUMMARY

1.1 Property Information and General MEP systems Condition

Sunnyside Elementary School is located at 123 Rabbit Chase Lane Smyrna, DE. The School was originally constructed in 2006. The building's heating source is a central boiler. Cooling is handled by packaged rooftop equipment.

SUNNYSIDE ELEMENTARY SCHOOL BUILDING INFORMATION	
Address	123 Rabbit Chase Ln, Smyrna, DE 19977
Year Built	2007
Building Area	55,056 SQ-FT
System Types	Central Boiler. Packaged RTUs.
Survey Date	17-Jul-18
Point of Contact	Scott Holmes

The majority of building equipment is good condition with minimal upgrades required in the near-term. However, nearly all refrigeration equipment utilizes R-22 which will need to be replaced or modified before 2020. Packaged rooftop units have a limited control interface with the central BAS which should be corrected whenever new units are specified.

1.2 Anticipated Lifecycle Replacement

ANTICIPATED LIFECYCLE REPLACEMENT	
Priority	**System / Equipment / Component**
Immediate	Domestic Supply Piping, RTU ATC Controllers
Short-Term	Packaged DX RTUs, Split DX Units
Mid-Term	Kitchen Make Up Air Unit, Interior and Exterior Lighting, Special Systems,
Long-Term	Boiler, Pumps, Terminal Units, Split DX Unit, Fans, Switchboard, Panelboards, Generator, Automatic Transfer Switch (ATS) Receptacles, Wiring, Disconnect Switches, and Fire Alarm

1.3 Cost Estimates

COST ESTIMATE			
#	**Description**	**Estimated Project Cost**	
1	Domestic Supply Piping Replacement with Uponer PEX	$	313,000.00
2	Replace ATC Controllers in (6) RTUs	$	81,000.00
3	Proposed Technology Improvements	$	341,400.00
	Total	**$**	**735,400.00**

2 SCOPE AND METHODOLOGY

2.1 Scope

The scope of this report is to assess the condition of existing MEP systems and provide the Smyrna School District a means to prioritize upgrades.

2.2 Methodology

Gipe Associates has made assessments and recommendations based on (4) main factors which include:

- Onsite surveys of equipment by visual inspection
- Review of the existing MEP drawings provided by the Smyrna School District
- Interviews with Maintenance Staff to identify chronic system issues, regular maintenance schedules and historical system operation
- American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Service Life Database (https://xp20.ashrae.org/publicdatabase/)

From these sources, judgements are made to assess equipment condition and determine the expected useful life remaining for MEP systems for this geographical location and use type. Condition assessments have been grouped in order of priority as defined in the next section.

2.3 Condition Assessment Priority Definitions

Code	Priority	Description
P-01	Immediate	Items that are currently overdue or that will be required within the next year (FY19). Equipment condition is either non-operational, in poor condition or not meeting performance needs.
P-02	Short-Term	Items that will be required within the next 2-3 years (FY20-FY22). Equipment condition is fair, signs of wear but still satisfactory as-is, additional maintenance and repair may be required as it continues to age.
P-03	Mid-Term	Items that will be required within the next 4-5 years (FY23-FY25). Equipment condition is good, performing satisfactory and expected to reach its estimated service life with regularly scheduled maintenance.
P-04	Long-Term	Items that will be required 5-10 years in the future (FY26+). Equipment condition is good – excellent, and has many years of useful service life remaining.

The next section tabulates all major equipment, capacities and condition assessments with a priority code.

3 MECHANICAL AND PLUMBING SYSTEMS

3.1 Heating, Ventilating and Air Conditioning (HVAC)

The building is served by several variable air volume (VAV) packaged rooftop units that are equipped with energy recovery wheels and hydronic heating coils. Hydronic heating is provided by central boilers and pumps located in the Mechanical Room.

Classrooms and administrative offices are zoned with dedicated VAV boxes with hydronic re-heat coils. The gym and cafeteria each have a single-zone VAV packaged RTU.

The following tables group all of the building's mechanical equipment and provide a condition assessment priority code.

HVAC Equipment Tables

CENTRAL HEATING SYSTEM		
System or Unit Type		Service Life Estimate (years)
Boiler(s), Hot Water		**25**
P-04	Quantity	2
	Capacity	3,172 MBH input each
	Performance Efficiency	80.0%
	Fuel	Dual Fuel: Natural Gas, #2 Oil
	Plant Heating Capacity	4,034 MBH
	Location	Mechanical Room
	Service	Entire Building
	Nameplate Date	2007

HYDRONIC DISTRIBUTION		
Equipment Type		Service Life Estimate (years)
Pump(s), Base-mounted		**20**
P-04	Quantity	2
	Capacity	15 HP each
	Control	VFDs on pumps, 3-way control valves on equipment
	Location	Mechanical Room
	Service	Entire Building for space heating
	Nameplate Date	2006
Pump(s), Inline		**18**
P-04	Quantity	2
	Capacity	1 HP each
	Control	Constant Speed
	Location	Mechanical Room
	Service	Boiler Primary Pumps
	Nameplate Date	2006

AIR DISTRIBUTION SYSTEMS		
Equipment Type		Service Life Estimate (years)
Packaged DX Unit, energy recovery wheel		**17**
P-02	Quantity	8
	Capacity	60 - 264 MBH
	Refrigerant	R-22
	Location	Roof
	Service	Entire Building - Variable Volume
	Nameplate Date	2007
Packaged DX Unit, air-cooled, gas heat		**17**
P-02	Quantity	2
	Capacity	18 - 72 MBH
	Refrigerant	R-22
	Location	Roof
	Service	Entire Building - Variable Volume
	Nameplate Date	2007

TERMINAL UNITS		
Equipment Type		Service Life Estimate (years)
Air Terminal, VAV box		**20**
P-04	Quantity	52
	Capacity	250 - 2,950 CFM
	Location	Above Ceiling
	Service	Entire Building
	Nameplate Date	2006
Radiant Heater, Hot Water		**25**
P-04	Quantity	7
	Capacity	650 BTU/ft
	Location	Exterior Walls
	Service	Administrative Offices, Conference Rooms
	Nameplate Date	2006
Unit Heater, Hot Water		**20**
P-04	Quantity	6
	Capacity	150 - 400 CFM
	Location	Wall Mounted
	Service	Vestibules
	Nameplate Date	2006

SUPPLEMENTAL UNITS		
Equipment Type		Service Life Estimate (years)
Split DX Unit, air-cooled		**17**
P-02	Quantity	2
	Capacity	9 - 18 MBH
	Refrigerant	R-22
	Condensing Unit Location	Roof
	Service	Kitchen, MDF Room
	Nameplate Date	2007
P-04	Quantity	1
	Capacity	18 MBH
	Refrigerant	R-410A
	Condensing Unit Location	Roof
	Service	Administrative Space
	Nameplate Date	2011

VENTILATION SYSTEMS		
System or Unit Type		Service Life Estimate (years)
Make-Up Air Unit, Gas Heat		**15**
P-03	Quantity	1
	Capacity	3,166 CFM
	Location	Roof
	Service	Kitchen
	Nameplate Date	2007
Fan, Centrifugal		**20**
P-04	Quantity	14
	Capacity	75 - 6,332 CFM
	Location	Roof
	Service	Bathrooms, Kitchen, Janitor Closets, General Exhaust
	Nameplate Date	2006

CONTROL SYSTEM		
System or Unit Type		Service Life Estimate (years)
Controls, Direct Digital (DDC)		**25**
P-01	Control Panel Location	Mechanical Room
	Service	All major equipment is connected to BAS Control Panels, but only a few control points are available for RTUs which should have control boards replaced.
	Nameplate Date	2007

Planned Improvements

Currently there are no improvement projects planned.

Deferred Maintenance and Replacement

The packaged controllers for the RTUs do not effectively interface with the supervisory ATC system. We recommend replacing the control boards and reprogramming the units to increase compatibility with the control system.

All RTUs utilize R-22, which will be phased out by the EPA in 2020. It is recommended that the units be replaced or modified in order to utilize refrigerants more widely available.

Anticipated Lifecycle Replacement

The following list summarizes all major mechanical equipment in fair – excellent condition that will eventually require replacement, refurbishment or repair once they age past their estimated useful life.

- Boilers
- Pumps
- Packaged DX Units
- Split DX Systems
- Fans
- Heating Units
- VAV Boxes
- Expansion Tanks

Future Use and Replacement

Long-Term HVAC System Recommendations

Ideally, ventilation systems and space conditioning systems are decoupled. This approach provides the most effective control over space temperature, humidity, and indoor air quality with minimal energy consumption. However, depending on life cycle costs and maintenance preferences, replacement in-kind should also be considered.

When existing building systems have reached the end of their lifecycle the following system types are recommended as possible replacements:

1. Air-Cooled Variable Refrigerant Flow (VRF) - Air side heat pump units are located on the roof. Heat pumps are interlocked with ductless type terminal equipment through refrigerant piping. Simultaneous heating and cooling is possible with VRF system. All heat pump equipment utilizes variable speed compressors and fan motors. Decouple energy recovery ventilators would provide both the building exhaust and ventilation airflow. ERV units shall utilize enthalpy wheels and demand controlled ventilation components. Exterior condensing units serving ERV units will be located on the ground. Heat for ERV units will be provided by the central boiler.
2. Ground Source Water-Cooled VRF - Ground coupled heat pumps are connected to the geothermal loop condenser water system. The ground coupled heat pumps are interlocked with ductless type terminal equipment through refrigerant piping. Simultaneous heating and cooling is possible with the VRF system. All heat pump equipment utilizes variable speed compressors and fan motors. Decoupled energy recovery ventilators would provide both the building

exhaust and ventilation airflow. ERV units shall utilize enthalpy wheels, hot-gas reheat, and demand controlled ventilation components.

3. Packaged VAV – Replace existing equipment in-kind with premium efficiency equipment.

It is crucially important to calculate life cycle costs to identify the most cost effective system replacement that is specific to this building.

3.2 Domestic Water Plumbing Systems

Plumbing Equipment Tables

PLUMBING SYSTEMS		
Plumbing System		**Description**
P-01	Domestic Supply	PEX/Galvanized Steel (4" Service)
P-04	Waste/Sewer Piping	Cast Iron
P-04	Vent Piping	Cast Iron/Copper
P-04	Fire Protection	Wet Pipe Sprinkler System (6" Service)
P-04	Water Meter Location	Mechanical Room

PLUMBING EQUIPMENT		
System or Unit Type		Service Life Estimate (years)
Domestic Hot Water Heater, natural gas		**15**
P-03	Quantity	1
P-03	Input Capacity	390 MBH
P-03	Storage Capacity	100 Gallon
P-03	Expansion Tank?	Yes
P-03	Location	Mechanical Room
P-03	Service	Entire Building
P-03	Nameplate Date	2007
Pump(s), Inline		**18**
P-04	Quantity	2
P-04	Capacity	1/20; 1/6 HP
P-04	Location	Mechanical Room
P-04	Service	Dishwasher, Domestic Hot Water Recirculation
P-04	Nameplate Date	2007

PLUMBING FIXTURES		
Typical Plumbing Fixture		**Flush Rating / Flow Rate / Size**
P-04	Water Closet	1.6 GPF
P-04	Urinal	1.0 GPF
P-04	Lavatory	0.5 - 2.2 GPM

	Janitor Sink	3.0 GPM
	Kitchen Sink	2.2 GPM
	Drinking Fountain	0.25 GPM

Planned Improvements

Uponor PEX is currently being installed in place of copper for domestic water supply piping in the 'A' wing of the building.

Deferred Maintenance and Replacement

The following items have been identified either during the survey effort or by the maintenance staff as items that require immediate repair or replacement:

- Copper domestic piping is prone to corrosion due to water chemistry in Smyrna. Other schools in the district have experienced this and replaced piping with Uponer PEX (cross-linked polyethylene). It is recommended that the Middle School do the same. Domestic water piping needs replacement in all areas except the Kitchen and 'A' Wing.

Anticipated Lifecycle Replacement

The following list summarizes all major plumbing equipment in fair – excellent condition that will eventually require replacement, refurbishment or repair once they age past their estimated useful life.

- Expansion Tanks
- Thermostatic Mixing Valves
- Plumbing Fixtures
- Piping Systems and valves

4 ELECTRICAL SYSTEMS

4.1 Electrical Service

Equipment Type				
Overhead Conductors			Underground Conductors	X
P-04	Transformer	(1) 750kVA @ 208V, Customer Owned		
	Utility Company	Town of Smyrna		
	Service Size	(1) 2,500A @ 208V		
	Meter	Primary Meter		
	Location	Mounted on side of metering station mounted next to transformer		
	Main Service Ground	Yes		
	Main Switchboard	(1) MDS – 2,500A	Main Distribution Panelboard	
	Manufacturer	Square D	Installation Date	2007

Equipment Type		
Panelboards		
P-04	Type	Distribution – HCM, Branch Panelboards – NQOD, NF
	Manufacturer	Square D

The building has a 2,500A, 120/208V, three phase main switchboard in the main electrical room that is fed from the 750kVA pad mounted transformer located outside the main electrical room. Based on information we received from the Town of Smyrna, the peak demand for the building in the last 12 months is 250 kW which converts to 694 Amperes (A). The existing main switchboard MDS has a maximum capacity of 2000A. Based on this information, the existing switchboard has adequate space and capacity to support additional load.

There are no immediate or significant repairs that need to be made to the electrical service or branch panelboards located in the main electrical room or throughout the school. The switchboard and panelboards are manufactured by Square D and were installed in 2007 and appear to be in good condition.

4.2 Emergency Power

Equipment Type		
Emergency Power		
P-04	Gen - Manufacturer	Kohler
	Size	60kW
	Fuel Type	Natural Gas
P-04	ATS (Manufacturer)	Kohler – (1) 150A Standby, (1) 60A Emergency

The generator is located outside on a concrete pad with the primary metering station, PMH-5 switch and transformer. The generator and associated automatic transfer switches were installed during the original construction in 2007 and appear to be in good condition. The generator is installed in a weather-proof enclosure and piped for natural gas. There do not appear to be any immediate or significant repairs that need to be made to the generator.

4.3 Lighting Systems

Equipment Type		
Lighting Systems		
P-03	Interior Lighting	Type: Linear Fluorescent, T8; Metal Halide
P-03	Exterior Lighting	Type: Wall mounted – Metal Halide, parking lot poles with Metal Halide lamp
P-04	Emergency Lighting	Type: Light fixtures throughout the building are fed from emergency circuit via generator.
	Illuminated Exit Signs	Yes
Switches		
P-04	Lighting Switches (Mounting Height)	46” to center of switch
P-04	Lighting Switches (Mounting Height) ADA Compliant	Yes

4.4 Power

Equipment Type		
Power		
P-04	GFCI receptacles at required locations	Yes
	Duplex receptacles (Grounding or no)	Grounding
	Duplex receptacles at HVAC equipment	Yes
P-04	Building Wire	Copper
P-04	Buck-boost transformer(s)	Good condition
P-04	Interior disconnects	Good condition
P-04	Exterior disconnects	Good condition

4.5 Special Systems

Equipment Type		
Special Systems		
P-03	Telephone Entrance	MDF Room
	Cable TV Service	Yes, MDF Room
	Fiber/Data on site	Yes, MDF Room
	Data racks (Location or spare capacity)	MDF Room, IDF rooms – Yes spare capacity
	Data Cabling	CAT 5
	CCTV	Yes
	Security (Manufacturer)	Honeywell
	Intercom (Aiphone)	No
	Card Reader(s)	Yes

While the lighting systems are not in immediate need of replacement, as part of general improvements to the building, changing from fluorescent and metal halide light sources to LED light sources would result in energy savings. Installing lighting controls such as occupancy sensors in the classrooms throughout the building could also increase energy savings as the current building does not have an automatic means to turn off the lights in that space when that space is unoccupied. The current lighting controls do not comply with the current edition of ASHRAE 90.1. Routine and periodic maintenance of the lighting system is recommended.

While the building receptacles are in good physical condition, the current National Electrical Code (NEC) requires that all child care facilities have tamper resistant receptacles. The NEC defines a child care facility as a building or portion thereof, for educational, supervisory, or personal care services for more than four children 7 years old or less. So, this elementary school would fit this definition so we would recommend that all non-locking-type 125V, 15 and 20 ampere(A) existing receptacles be replaced with tamper-resistant receptacles. The existing exterior disconnects are in fair condition but, we would recommend that new NEMA 4X, stainless steel disconnects be provided for all exterior HVAC equipment that is replaced in the future. The technology department has some planned improvements for buildings special systems as outlined below in the planned improvements section of this report.

4.6 Fire Alarm

Equipment Type			
Fire Alarm System			
P-04	**Item**	**Yes**	**No**
	Horns or Bells	X	
	Strobe Lights	X	
	Voice Evacuation		X
	Battery Back-up	X	
	Automatic Dialer	X	
	Smoke Detectors	X	
	Outdoor Bell	X	
	Duct Detectors	X	

	Smoke Dampers	X	
	Manual Stations at Exit	X	
	ADA compliant	X	
	Location of FACP	MDF Room	
	Fire Alarm (Addressable or Analog)	Addressable	
	Manufacturer	Simplex 4100	
	Date of Installation	2007	
Annunciator			
P-04	Remote Annunciator	Yes	
	Annunciator (Graphic or Alphanumeric)	Alphanumeric	
	Remote Annunciator Location	Front Lobby	

There are no immediate or significant repairs that need to be made to the building fire alarm system. Routine and periodic testing and maintenance of the fire alarm system is recommended. While the existing fire alarm is in good condition, it utilizes audible horns and visual strobe notification devices and does not have a voice evacuation system. The 2015 NFPA 101 Life Safety Code requires that any new schools with 100 or more occupants have a fire alarm system utilize an emergency voice/alarm communications system to notify occupants. Even though a change is not required now, if a major renovation was to occur to the existing school, then the existing fire alarm system would need to be upgraded to a voice evacuation system.

4.7 Code Deficiencies

1. Replace all existing building non-locking-type 125V, 15 and 20 ampere receptacles with tamper-resistant receptacles to comply with the current National Electrical Code.
2. Upgrade Fire Alarm system to voice evacuation system to comply with current NFPA 101 Life Safety Code.

Planned Improvements

- Upgrade fiber cabling between MDF and IDF rooms to OM4.
- Upgrade cabling between data closets and network drops to Category-6 copper cabling.
- Add wireless access points to non-educational (cafeteria, gym, guidance office) spaces (cost estimate based on 6 devices).
- Provide uninterruptible power supply (UPS) at all access door control panels (cost estimate based on 7 devices).
- Provide video surveillance camera system for the entire school.

Deferred Maintenance

There are no current deferred maintenance projects for the electrical system at the Sunnyside Elementary School.

General Improvements

- Replace interior and exterior lighting with LED fixtures
- Provide lighting controls throughout the building to automatically turn lights off in spaces that are empty

Anticipated Lifecycle Replacement

The following list summarizes all major equipment that is currently in fair – excellent condition that will eventually need replacement:

- Switchboard(s)
- Panelboard(s)
- Transformers
- Generator
- Automatic Transfer Switch (ATS)
- Lighting
- Receptacles
- Fire Alarm Panel
- Security System
- Video Cameras

APPENDIX A

FACILITY PHOTOGRAPHS

Sunnyside Elementary School Mechanical Photos

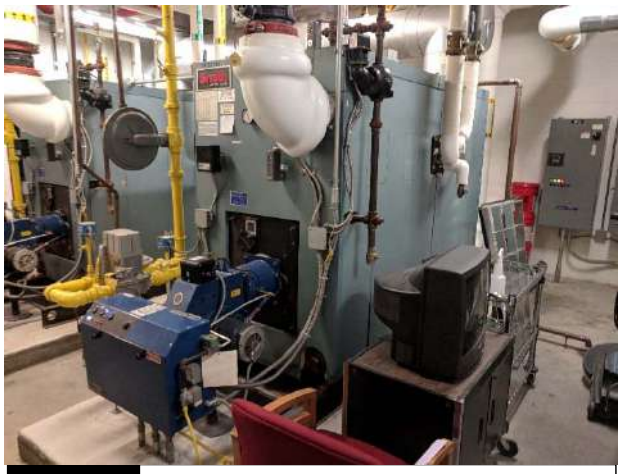

Photo #1	Boilers in Mechanical Room

Photo #2	Domestic and Fire Protection Water Entrances

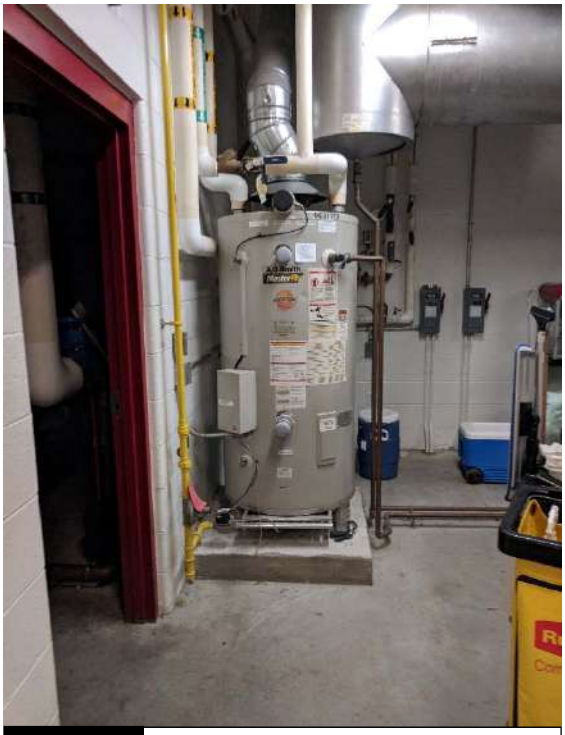

Photo #3	Domestic Water Heater

Photo #4	Exterior of the front of the school

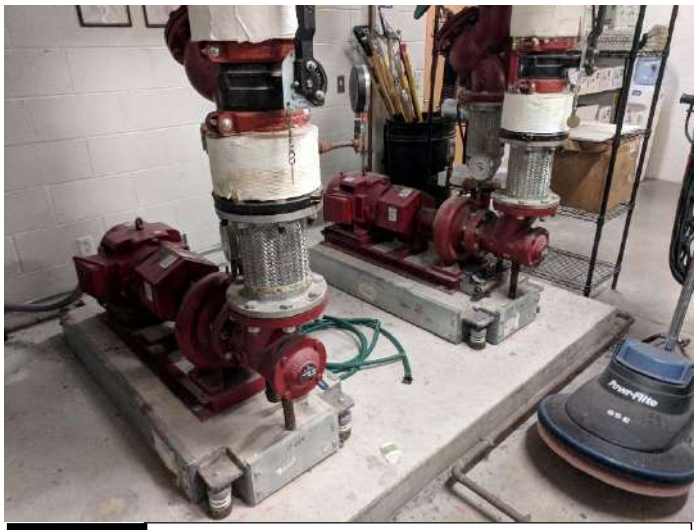

Photo #5	Heating Water Pumps in Mechanical Room

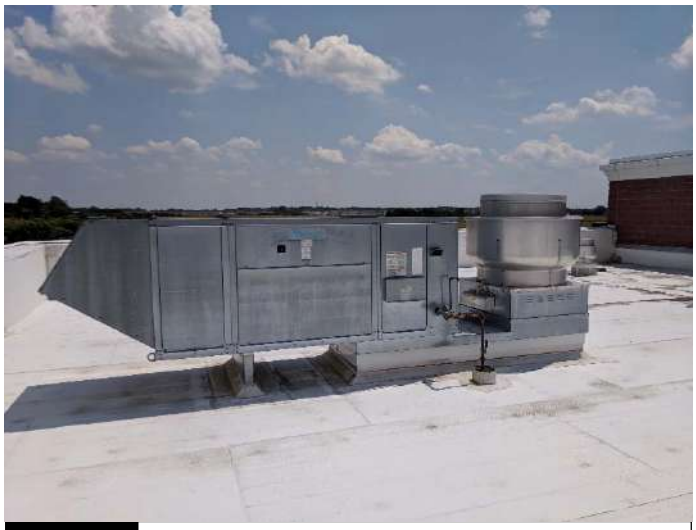

Photo #6	Kitchen Make Up Air Unit

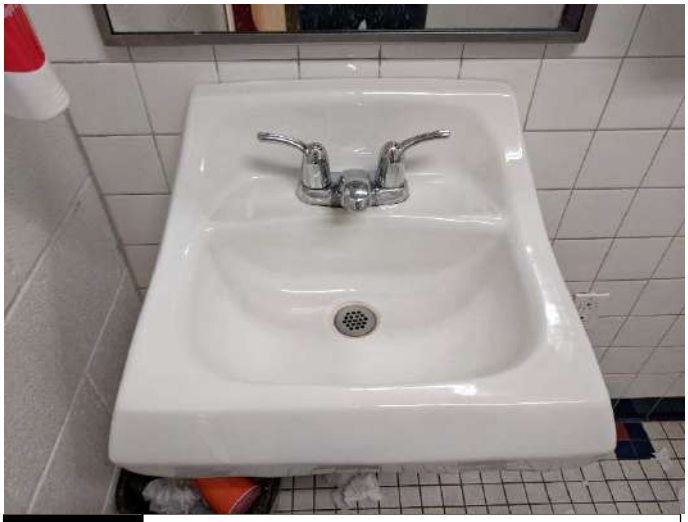

Photo #7	Typical Bathroom Lavatory

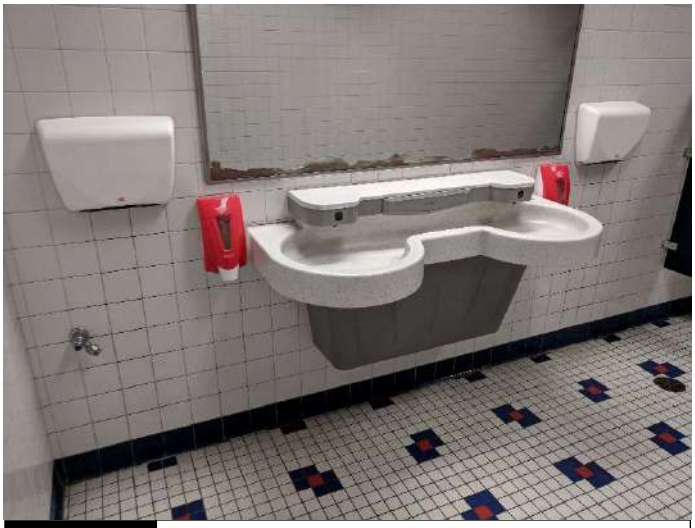

Photo #8	Typical Gang Bathroom Hand Sink

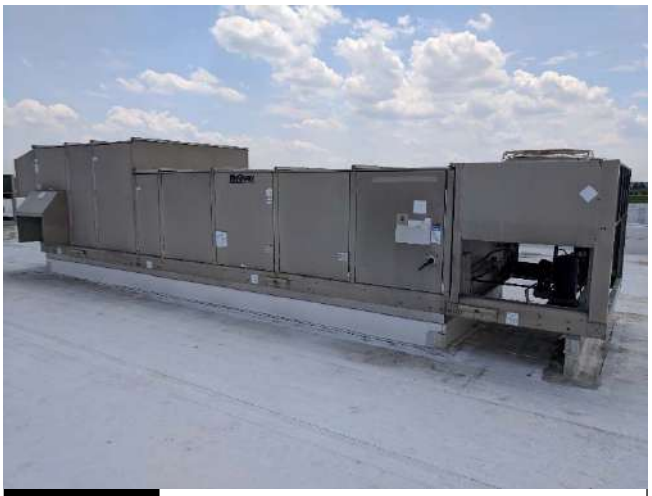

Photo #9	Typical Packaged RTU with Energy Recovery

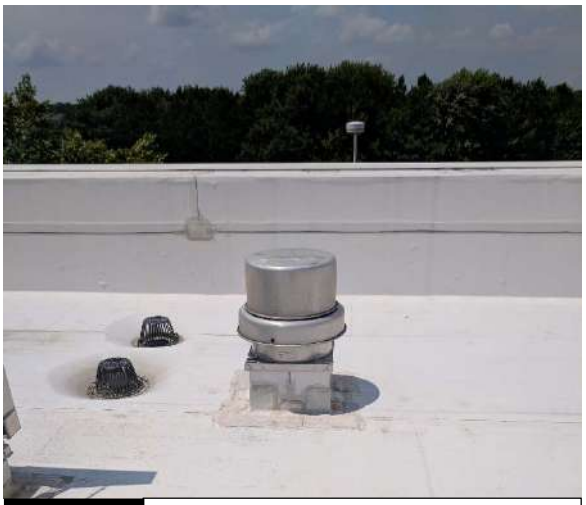

Photo #10	Typical Rooftop Exhaust Fan

Photo #11	Typical Split DX Condensing Unit

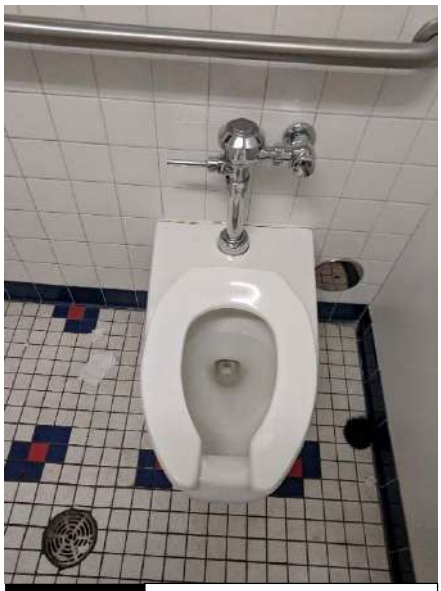

Photo #12	Typical Toilet

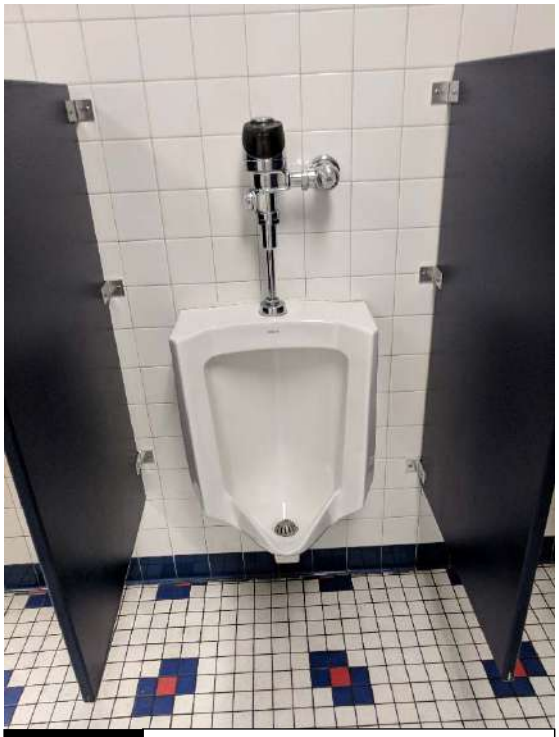

Photo #13	Typical Urinal

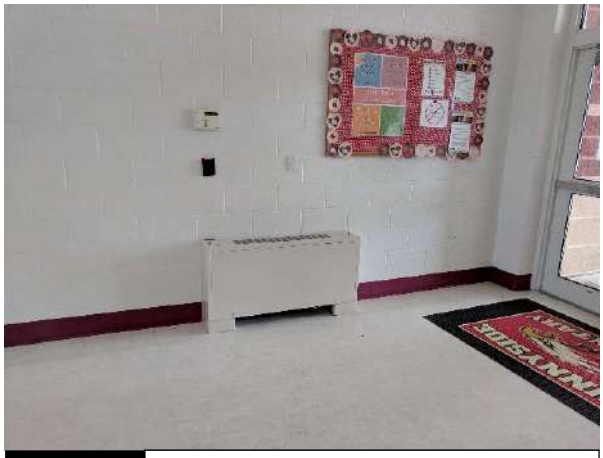

Photo #14	Typical Vestibule Cabinet Heater

Photo #15	Typical Electric Water Coolers

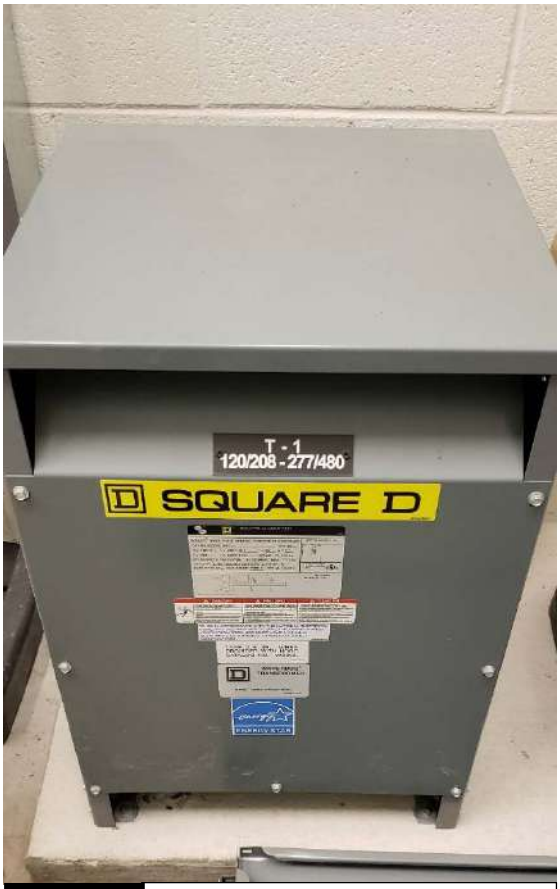

Photo #1	208V to 480V Boost Transformer

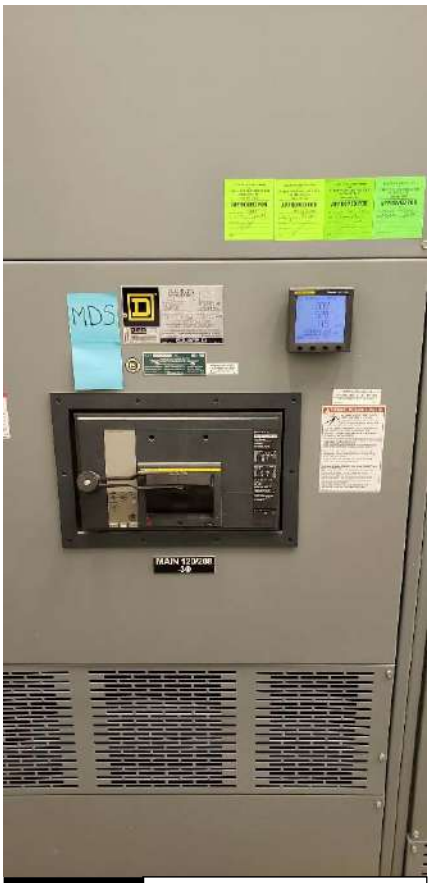

Photo #2	2500A Breaker in Main Switchboard

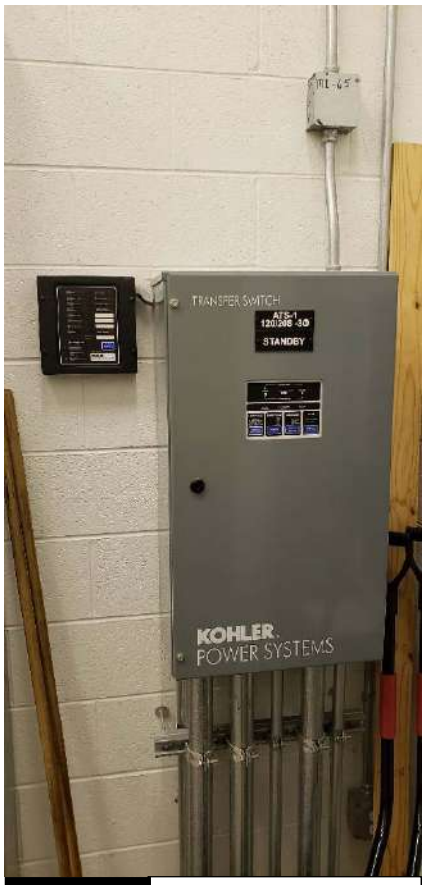

Photo #3	ATS-1 and Remote Annunciator

Photo #4	Exterior Electrical Equipment and Wallpack

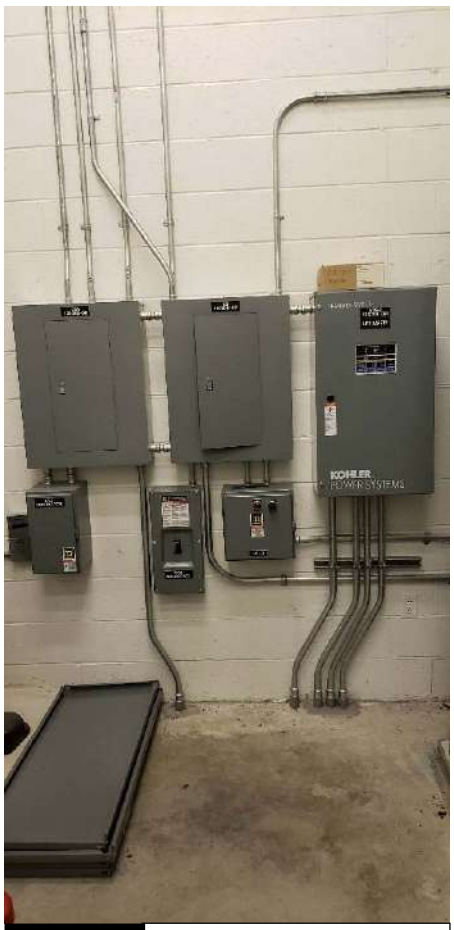

Photo #5	ATS-2 and Life Safety Panelboards

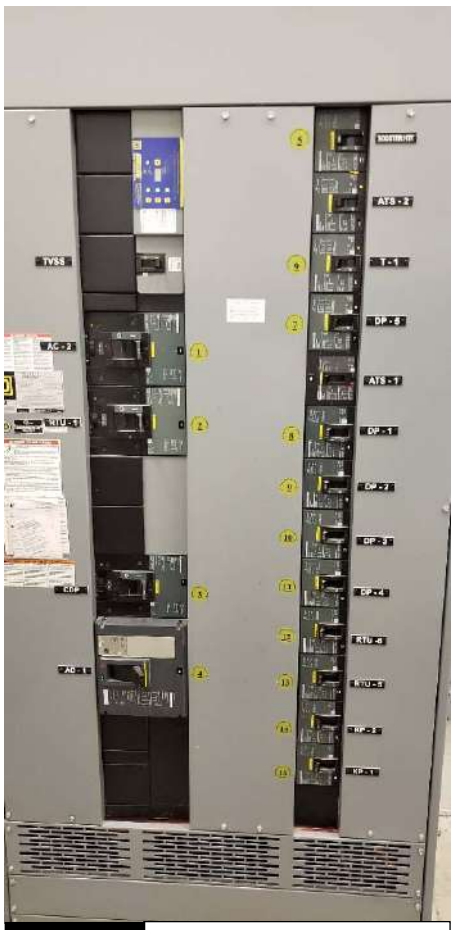

Photo #6	Distribution Section of Main Switchboard

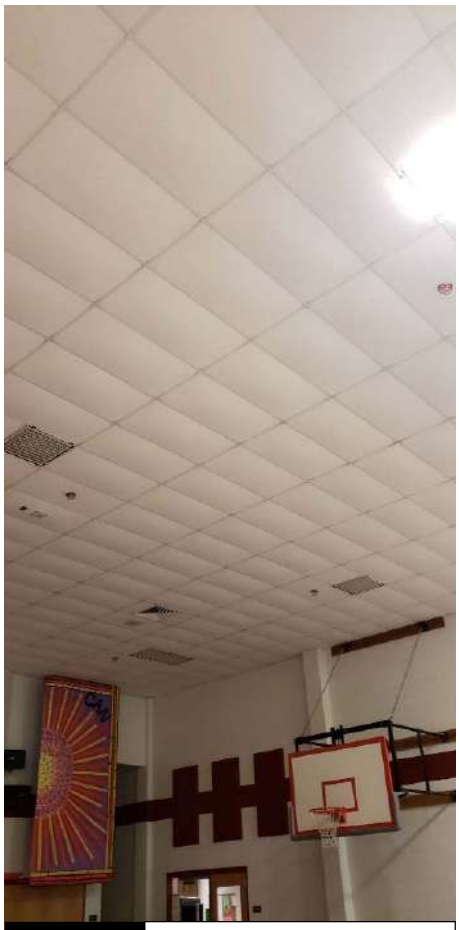

Photo #7	Lights and Ceiling in Gym/Auditorium/Cafe

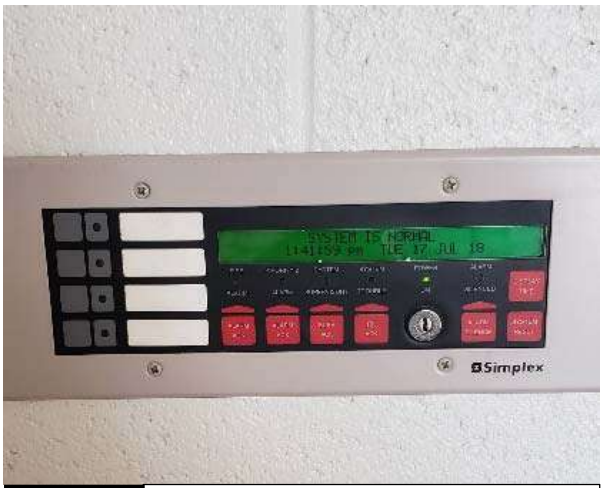

Photo #8	Fire Alarm Annunciator Panel

Photo #9	Metering Station, Transformer PMH-5 Switch and Generator

Photo #10	Primary Meter located on Metering Station

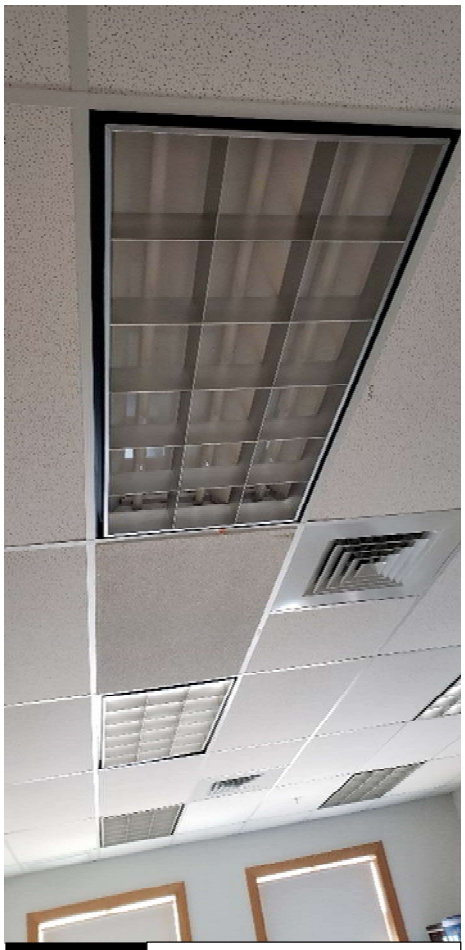

Photo #11	Typical Classroom Lighting Fixture

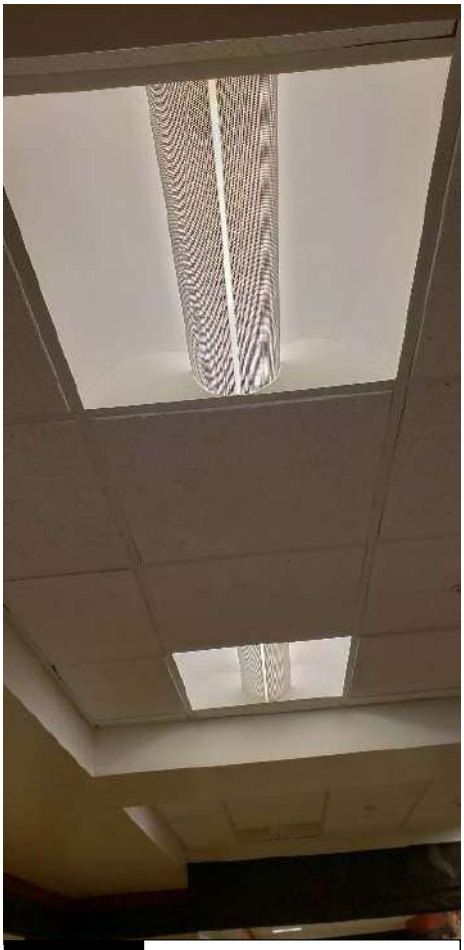

Photo #12	Typical Corridor Lighting Fixture

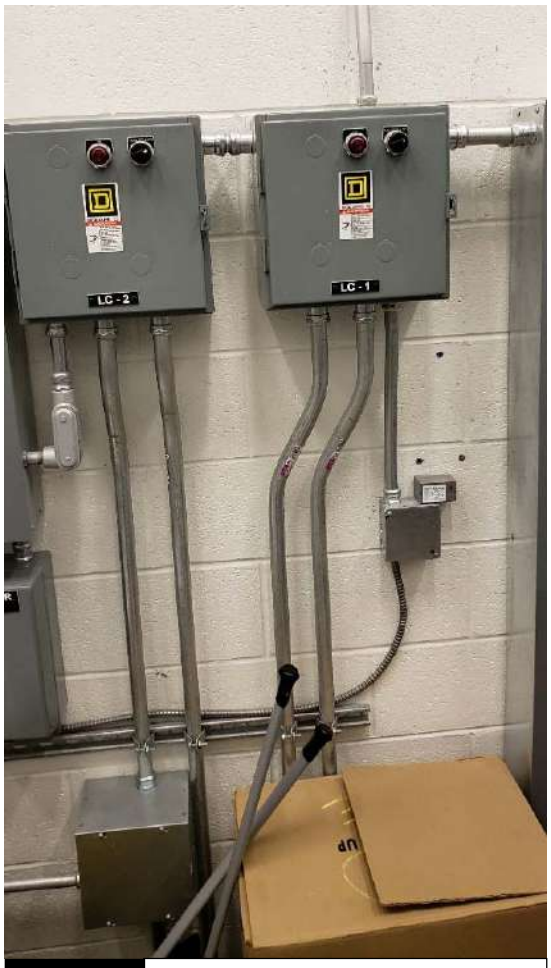

Photo #13	Typical Lighting Contactor for Site Lighting Fixtures

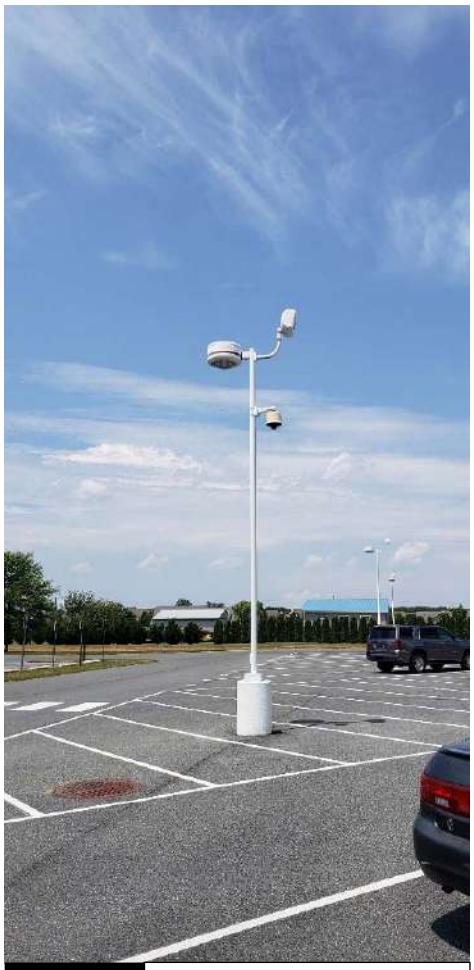

Photo #14	Typical Parking Lot Light Fixture

Photo #15	Typical Square D HCM Distribution Panelboard

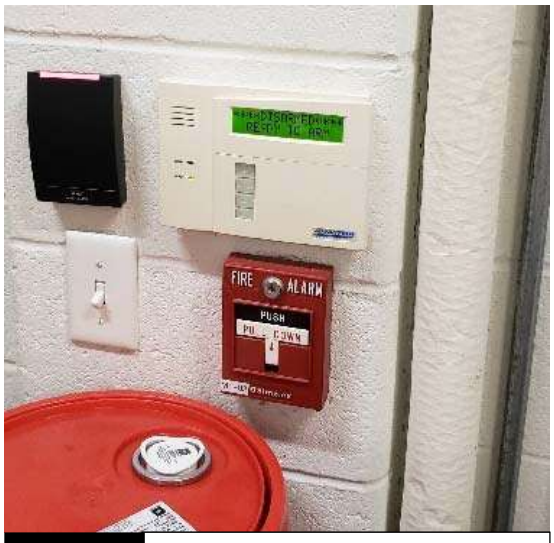

Photo #16	Typical Security Keypad and Card Reader

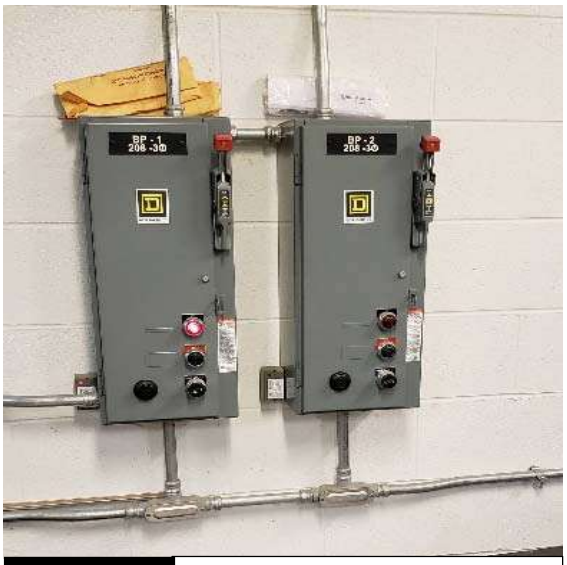

Photo #17	Typical Square D Motor Controllers

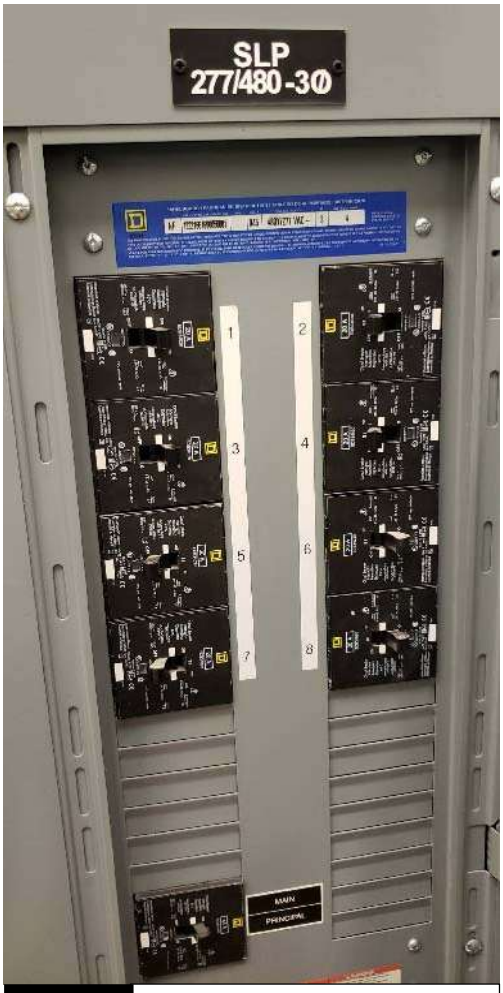

Photo #18	Typical Square D NF (480V) Branch Panelboard

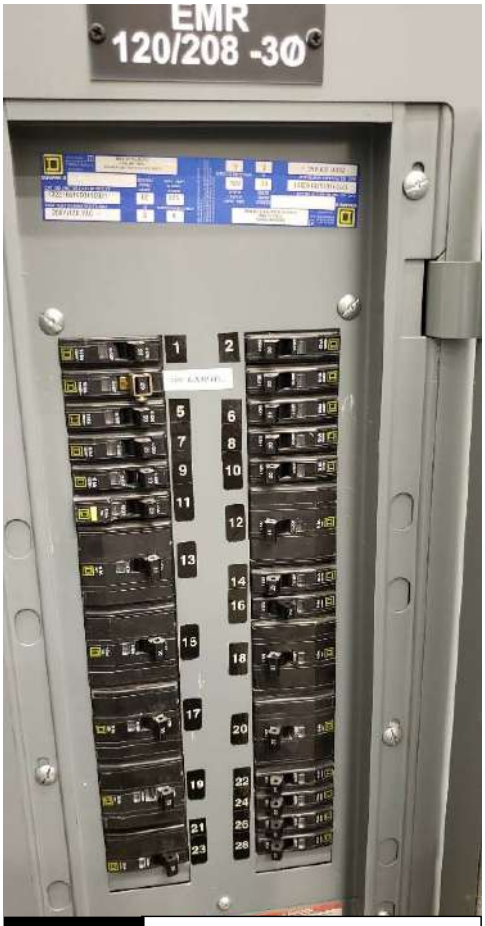

Photo #19	Typical Square D NQOD Branch Panelboard

APPENDIX B

COST ESTIMATE

Gipe Associates, Inc.
CONSULTING ENGINEERS
Mechanical | Electrical | Plumbing

8719 BROOKS DRIVE
EASTON, MARYLAND
PHONE: 410-822-8688
FAX: 410-822-6306

CONSTRUCTION COST ESTIMATE

PROJECT: SUNNYSIDE ELEMENTARY SCHOOL
GAI PROJECT NO: 18047
DATE: 07/27/18
PREPARED BY: MEO

GENERAL PROJECT INFORMATION

PROJECT SQUARE FOOTAGE: 50,000
FACILITY TYPE: EDUCATION - CLASSROOMS
 # OF FLOORS: 2
ARCHITECT: FEARN-CLENDANIEL
BASIS FOR ESTIMATE: CERT. OF NECESSITY
SUMMARY: PRELIMINARY ESTIMATE

1 - PEX REPLACEMENT	QUANTITY		MATERIAL		LABOR		TOTAL
	NO. OF UNITS	UNIT OF MEASURE	PER UNIT	TOTAL	PER UNIT	TOTAL	COST
BASE BID COST ESTIMATE							
PIPING DEMOLITION	1.0	LS		$ -	$ 20,000.00	$ 20,000.00	$ 20,000.00
DOMESTIC COLD PEX	1.0	LS	$ 35,000.00	$ 35,000.00	$ 40,000.00	$ 40,000.00	$ 75,000.00
DOMESTIC HOT PEX	1.0	LS	$ 30,000.00	$ 30,000.00	$ 50,000.00	$ 50,000.00	$ 80,000.00
DOMESTIC RECIRC PEX	1.0	LS	$ 15,000.00	$ 15,000.00	$ 15,000.00	$ 15,000.00	$ 30,000.00
VALVES, FITTINGS, TOOLS	1.0	LS	$ 30,000.00	$ 30,000.00	$ 20,000.00	$ 20,000.00	$ 50,000.00
PIPING INSULATION	1.0	LS	$ 15,000.00	$ 15,000.00	$ 15,000.00	$ 15,000.00	$ 30,000.00
ADDITIONAL PIPE HANGERS	1.0	LS	$ 7,000.00	$ 7,000.00	$ 7,000.00	$ 7,000.00	$ 14,000.00
FIRESTOP COLLARS	1.0	LS	$ 4,000.00	$ 4,000.00	$ 4,000.00	$ 4,000.00	$ 8,000.00
DOMESTIC HOT WATER BALANCING	1.0	LS		$ -	$ 6,000.00	$ 6,000.00	$ 6,000.00

COST ESTIMATE SUMMARY

DESCRIPTION	MATERIAL	LABOR	TOTAL
BASE BID TOTAL COST	$ 136,000.00	$ 177,000.00	$ 313,000.00
TOTAL BASE BID:	**$ 136,000.00**	**$ 177,000.00**	**$ 313,000.00**
TOTAL BASE BID COST PER SQUARE FOOT:	**$2.72 PER S.F.**	**$3.54 PER S.F.**	**$6.26 PER S.F.**

GRAND TOTAL COST ESTIMATE SUMMARY

ADDITIONAL PROJECT COST ITEM DESCRIPTION (APPLIES TO BASE BID ONLY)	PERCENTAGE (%)	% X TOTAL BASE BID	REMARKS
CONTRACTOR OVERHEAD	0.0%	$ -	
CONTRACTOR PROFIT	0.0%	$ -	
GENERAL CONDITIONS	0.0%	$ -	
BUILDER'S RISK INSURANCE	0.0%	$ -	
PERMIT FEES	0.0%	$ -	
CONTRACTOR INSURANCE	0.0%	$ -	
PAYMENT BOND	0.0%	$ -	
PERFORMANCE BOND	0.0%	$ -	
TOTAL ADDITIONAL PROJECT COST ITEMS		**$ -**	
GRAND TOTAL CONSTRUCTION COST (BASE BID + ADDITIONAL PROJECT COSTS)		**$ 313,000.00**	**$6.26 PER S.F.**

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PHONE: 410-822-8688
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CONSTRUCTION COST ESTIMATE

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FACILITY TYPE: EDUCATION - CLASSROOMS
 # OF FLOORS: 2
ARCHITECT: FEARN-CLENDANIEL
BASIS FOR ESTIMATE: CERT. OF NECESSITY
SUMMARY: PRELIMINARY ESTIMATE

2 - RTU ATC CONTROLLER REPLACEMENT	QUANTITY		MATERIAL		LABOR		TOTAL
	NO. OF UNITS	UNIT OF MEASURE	PER UNIT	TOTAL	PER UNIT	TOTAL	COST
BASE BID COST ESTIMATE							
RTU ATC CONTROLLERS AND WIRING	6.0	LS	$ 4,000.00	$ 24,000.00	$ 6,000.00	$ 36,000.00	$ 60,000.00
COMMISSIONING	6.0			$ -	$ 3,500.00	$ 21,000.00	$ 21,000.00

COST ESTIMATE SUMMARY

DESCRIPTION	MATERIAL	LABOR	TOTAL
BASE BID TOTAL COST	$ 24,000.00	$ 57,000.00	$ 81,000.00
TOTAL BASE BID:	**$ 24,000.00**	**$ 57,000.00**	**$ 81,000.00**
TOTAL BASE BID COST PER SQUARE FOOT:	**$0.48 PER S.F.**	**$1.14 PER S.F.**	**$1.62 PER S.F.**

GRAND TOTAL COST ESTIMATE SUMMARY

ADDITIONAL PROJECT COST ITEM DESCRIPTION (APPLIES TO BASE BID ONLY)	PERCENTAGE (%)	% X TOTAL BASE BID	REMARKS
CONTRACTOR OVERHEAD	0.0%	$ -	
CONTRACTOR PROFIT	0.0%	$ -	
GENERAL CONDITIONS	0.0%	$ -	
BUILDER'S RISK INSURANCE	0.0%	$ -	
PERMIT FEES	0.0%	$ -	
CONTRACTOR INSURANCE	0.0%	$ -	
PAYMENT BOND	0.0%	$ -	
PERFORMANCE BOND	0.0%	$ -	
TOTAL ADDITIONAL PROJECT COST ITEMS		**$ -**	
GRAND TOTAL CONSTRUCTION COST (BASE BID + ADDITIONAL PROJECT COSTS)		**$ 81,000.00**	**$1.62 PER S.F.**