Rhawnhurst Elementary School

7809 Castor Avenue, Philadelphia, PA 19152

Main Entrance

Addition and Major Renovation

Scope Determination Report

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1.0 General Information

Rhawnhurst Elementary School is located at 7809 Castor Avenue in Northeast Philadelphia. The site contains multiple buildings, including a Main Building, Annex, and a trailer. The site is bound by Castor Avenue to the West, Large Street to the East, and by residential neighborhoods to the North and South. The main entrance, located off of Castor Avenue on the Western edge of the site, consists of a central 2-story classroom section, flanked by one-story classroom sections on each side. The main entrance provides direct access to a one-story auditorium, offices and corridors. A one-story cafeteria and gymnasium are located down a corridor aside the auditorium, and at the rear of the main building. The exterior walls of the main building are composed of brick with stone coping throughout and stone cladding at the main entrance portal. Mechanical and electrical equipment are housed in a partial basement on the Southwestern corner of the building, and piping is located under the first floor in a large crawl space. The Annex building erected off of the gymnasium, is a one story building with elevated slab-on-grade construction and interlocking structural metal panel walls. Students travel between the main building and the Annex through the Gymnasium.

1.1 Building Data:

Gross Area (SF):	Main Building: 46,000 (2 story)
	Annex: 7,000 (1 story)
	Trailer: Unknown
Year Built:	Main Building: 1949
	Annex: 1957
	Trailer: unknown
Enrollment:	689 students
Grade:	K-5 + Early Childhood
Construction Budget:	$11,619,979

1.2 Project Introduction:

The Office of Capital Programs has determined the need for a major renovation of the main building and a building addition are necessary to address current capacity and daily operation at Rhawnhurst Elementary School. A detailed scope determination report was been prepared by a team from the Design Unit.

This K-5 school serves 689 students, including (1) early childhood classroom, (3) Kindergarten classrooms, (4) First Grade classrooms, (3) Second Grade classrooms, (4) Third Grade classrooms, (3) Fourth Grade classrooms, and (3) Fifth Grade classrooms for a total of (21) classrooms. In addition to the classrooms, the building includes a Lobby, Offices, an Auditorium, a Gymnasium and a Cafeteria. The Annex building provides (6) classrooms. The trailer provides limited space for special instruction. Fourteen classroom spaces are dedicated to general instruction, one classroom is dedicated to computer technology and one classroom is dedicated as the Library. The school is currently beyond capacity, and unable to support designated spaces for special instruction, such as art, music, health, writing, science, and character education.

The lack of space for classrooms within the school building has increased class sizes. Grades one and two are located in the annex building, remote from other classrooms and restrooms. Ideally, classrooms for age related groups would be located adjacent to one another.

A two-story addition is necessary to alleviate present overcrowding. The addition should accommodate (16) standard-size classrooms (850 SF) and 4 small group instruction classrooms (660 SF) for a total of (20) classrooms. Classroom(s) within the main building may be renovated to support small group instruction and to provide accessible connections to the first and second floors of the main building. Optimal circulation and improved access are required. The annex building will be demolished and the trailer will be removed from the site, including associated removal of utilities, as a part of this project.

2.0 Background

The following are lists of deficiencies and recommended actions that define the scope of work. They are divided into the following categories: Environmental, Site, Architectural, Structural, Mechanical/Plumbing, and Electrical.

The scope of work developed for this report is based on information contained within the ongoing "Facility Condition Assessment" and as verified during a tour and survey of the school that included Capital Programs design and construction staff, as well as staff from the School District's Operations and Maintenance Departments. Work order history from the last five years indicates that extensive boiler, electrical, roofing, plumbing and door hardware repairs have been necessary.

3.0 Scope of Work

The proposed scope of work is outlined below.

3.1 Environmental

The School District of Philadelphia (SDP) Office of Environmental Management & Services (OEMS) will develop scope of work for remediation services where applicable. Work will involve removal of mold and asbestos containing materials, where applicable, prior to any investigation or repair can occur. Environmental budget and scope of work will also include abatement required for other work described hereinafter.

3.2 Site

A. Exterior Observations

The site is currently asphalt and contains the main school building footprint along with one modular building in the center of the property. Asphalt is in moderate to good condition throughout with surface cracking evident in certain locations, primarily in the southwest and southeast portions of the parking lot. Asphalt condition is poorest in the designated

teacher parking area, which is separated from the schoolyard via a low decorative fence. The parking appears to be at maximum capacity and is in need of organization and additional space. Dumpsters are located on the North side of the school with trucks entering from the northernmost curb cut along Castor Avenue. The site landscaping is well maintained.

The parcel gross area is 338,400 sf with approximately 180,000 sf of this being impervious area.

B. Recommended Actions:

The scope of work includes demolition of the existing modular building, removal of the trailer and construction of a new addition. All site work shall comply with the School District's Design Standards.

Aerial View of Site

At a minimum, the site scope shall include the following items:

I. Site Preparation:

a. Install E&S measures, if applicable, in compliance with Philadelphia Water Department's regulations.

II. Demolition:

a. Demolish trailer.
b. Demolish Annex w/ the connecting corridor.
c. Disconnect and cap active utilities feeding the trailer and the Annex.

III. New Addition & Site work

The design consultant ("consultant") will be responsible for analyzing the opportunities and challenges of the existing site, and the indoor and outdoor pedestrian and vehicular circulation in order to arrive at the most desirable placement for the new addition. The consultant shall maximize function and aesthetics, while remaining within the allotted budget. The consultant's analysis for building placement shall include, but not be limited to: (1) opportunities for maximizing daylight within the new addition; (2) connecting to the existing school building for efficient interior circulation; and (3) vehicular entry and arrival sequences, including trash pickup and staff parking. Placement of the new addition shall carefully consider incorporating locations for imaginative and creative outdoor play, physical education, and outdoor learning. It will also provide efficient layout and connection to existing site and street utilities with positive grading and drainage from all existing and new site buildings. For the purposes of scope determination cost estimating, the following should be assumed:

a. Excavation, earthwork and grading for new foundation of addition (assume 14,000 sf footprint)
b. New foundation for addition (see architectural/structural scope for assumptions) (assume 13,000 sf footprint)
c. New utility connections and new lines to/from street for sewer, water, gas, and electric.
d. New ADA accessible ramp– 6" reinforced concrete with painted steel handrails.
e. Pavement restoration
    - New pavement surrounding addition (assume 10,000 sf concrete, assume 4" reinforced slab on 4" 2a modified stone base);
    - New asphalt restoration at staff parking area and demolition of modular footprint (assume 25,000 sf of full depth asphalt (1 ½" wearing and 3" binder)

on 6” depth 2a modified stone base);

View of Pavement @ Parking Lot

- Mill and Overlay asphalt (86,301 sf)
- Dumpster pad and enclosure - 200 sf concrete, 8” thick slab, reinforced with galvanized wire mesh on 6” thick 2a modified stone base; steel and composite wood dumpster enclosure; and new area drain and CIP connection to existing sewer.

f. Greening and Play Allowance:
   - The consultant shall include designs for age-appropriate outdoor play, learning and physical education areas. These may include, but not be limited to elements such as: creative seating, shading and greening, nature play activities, outdoor learning spaces, organized recess and gym activities, and imaginative play areas. The outdoor learning and play shall be creatively incorporated but remain within a modest allotted budget. Traditional play equipment structures should be avoided for more imaginative play opportunities. Morning lineup markings shall be included within the outdoor play area and shall be developed in close consultation with the principal. Maintenance-friendly landscaping upgrades, including selective new trees and shrub/groundcover underplantings, shall be included per the approved SDP species list.

- *Note: For budgeting purposes, we recommend a cost allowance of $100,000 - $150,000 for greening and play to be itemized during schematic and design development.*

g. Stormwater Management:

- The preference of the School District is to keep earth disturbance below the PWD's requirements for stormwater management practices. The design consultant shall strive to reduce the disturbance to a minimum and to determine if stormwater management is required for the project. If stormwater management is required, the design consultant shall present two different conceptual options, along with cost estimates, for review and consideration to the District no later than the design development submission. Stormwater management shall not include porous pavement or pavers. All stormwater management designs shall comply with the Philadelphia Water Department's (PWDs) latest regulations and the Pennsylvania Department of Environmental Protection's (PADEP) NPDES requirements if project disturbance exceeds 1 acre. Underground stormwater systems are preferred.

  For the purposes of scope determination budgeting, the following shall be assumed for the stormwater management system:

  - 6,000 sf subsurface system @ 6' depth excavation
  - Associated drainage infrastructure:
    - (6) 4'x2' inlets;
    - 12" RCP drainage pipe to subsurface stormwater system - 1000 lf;
    - 800 lf of 48" perforated HDPE pipe, rated for vehicular loading
  - 335 cy AASHTO #57 clean washed stone, per PWD spec
  - 1,600 sy nonwoven geotextile per PWD spec
  - Manholes (4)
  - Observation wells (2)
  - Outlet control structures (1)
  - Jellyfish (or equal) water quality insert (1)
  - Cost allowance for piping and street connection tie-in back to sewer

3.3 Architectural

A. New Building Addition

Design of a two-story classroom addition that consists of (16) classrooms and (4) small instruction rooms. Design Consultant shall evaluate potential locations for the addition on the project site. The current proposed location for the addition is at the Southwestern edge of the main building, (connecting from the existing two-story section and with a below grade connection to the basement boiler room), and extending perpendicular to the main building towards the rear of the property. The addition must provide an entranceway from the rear of the property and consider optimal circulation. It is anticipated that the addition must include an elevator, exit stair tower, and student restrooms to serve the expanded

building capacity, as well as associated storage and mechanical/electrical/IT rooms. Provide an enclosed electrical room at the lower level at approximately two hundred square feet. Design must be in compliance with all applicable International, City and Government Agency Codes and Requirements.

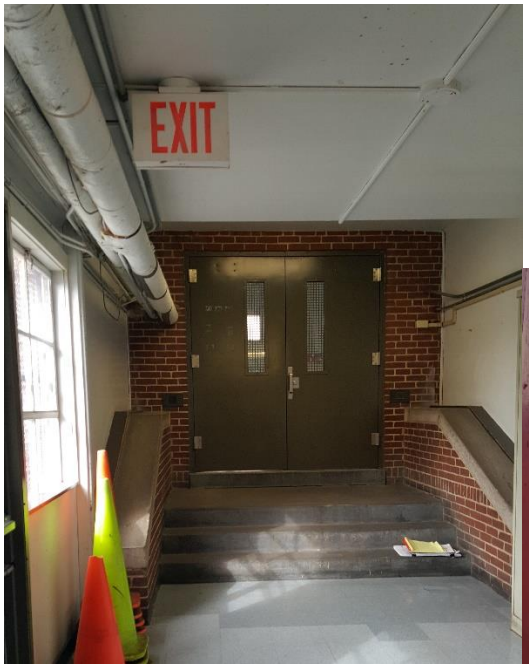
Minimum square footage requirements planned for each space is listed below:

General Classrooms	16 required	13,600 SF (850 SF each)
Small Instruction Classrooms	4 required	2,400 SF (600 SF each)
Storage - Educational	1 required	150 SF
Total Educational Space		16,150 SF
Connecting Corridor	2 req'd (1/flr, 10' x 60')	600 SF
Entrance Lobby	1 req'd (20 x 20)	400 SF
Utility Connection	1 req'd (10 x 25)	250 SF
Circulation	approx. 20% of bldg. space	3,526 SF
Stair	1 req'd (shaft-. 10' x 20')	800 SF
Building Storage	1 req'd	250 SF
Technology closet	1 req'd	100 SF
Elevator shaft	1 req'd	160 SF
Elevator Equip Room	1 req'd	80 SF
Mech/Elect room	1 req'd	500 SF
Student toilets	(calculate quantity)	1000 SF
Janitor's Closet	2 req'd (1/flr)	60 SF
Total – Non-Instructional space		7,726 SF
Total – Educational + Non-Instructional Space =		**23,876 SF**

Classrooms shall include VCT flooring, ACT ceilings, 16'-0" of marker board, 24'-0" of tackboard, (1) interactive panel board, LED lighting, power and data receptacles in accordance with SDP's Ideal Classroom Technology Standard, a wireless clock, speakers and a telephone. Corridor and bathroom walls shall be masonry construction.

B. Annex Demolition

The building annex system was originally manufactured by Steelox Industrial Buildings, with the Steelox lightweight interlocking frameless structural wall and roof panels on a raised reinforced concrete slab and foundation, all of which shall be demolished. The connector corridor is flashed into the masonry façade and the removal of utilities back to their source, require masonry repair/restoration. Selective demolition of perimeter connective surfaces and restoration of steps, provision of features for accessibility and safety such as new ramps, handrails and exterior lighting will be required. All utilities and services to the Annex must be disconnected to the source.



Annex Connector Corridor Interior

Annex Connector Corridor Exterior

Annex Rear Elevation

Annex Side Elevation

C. Building Renovation

I. Exterior Doors

At the main building, the exterior doors are primarily hollow metal steel doors and frames. The main entrance doors are in poor condition. The surrounding doors are in average to poor condition.

Front Entrance

Recommended Action:

a. Replace the main entrance doors, (one pair of double doors and two single entrance doors) with more historically sensitive raised metal panel doors, code compliant hardware, egress bars and intercom activated access. Sand prime and paint transom and trim surrounding the main entrance doors. Replace all remaining exterior doors and hardware, closers, weatherstrip, and thresholds budget permitting.
b. Provide accessibly visible complete directional signage to accessible entrance.

II. Windows:

Exterior windows in the main building and Annex are clear anodized aluminum frame units with plexi-glass single hung (non-insulated) units, in aged condition.

Recommended Action:

Provide window replacement and/or refurbishment by replacing existing acrylic glazing at all windows with new insulated glazing units. Top panel shall be fixed and counter balances shall be replaced to accommodate the additional weight of the new glass unit where possible. Existing window mounted air conditioners serving a few classrooms may stay in place, or be salvaged in coordination with mechanical scope.

III. Exterior steps, stone and walkways

The main entrance steps are discolored granite with loose or missing grout at all joints. Cores for handrails have spalled and are collecting surface water. Precast stone surround at the main entrance and precast coping at the roof, have darkened due to weathering and grime. Brick is exhibiting signs of spalling and efflorescence in several areas at the first floor level indicating water penetration from above.

Front Steps

Recommended Action:

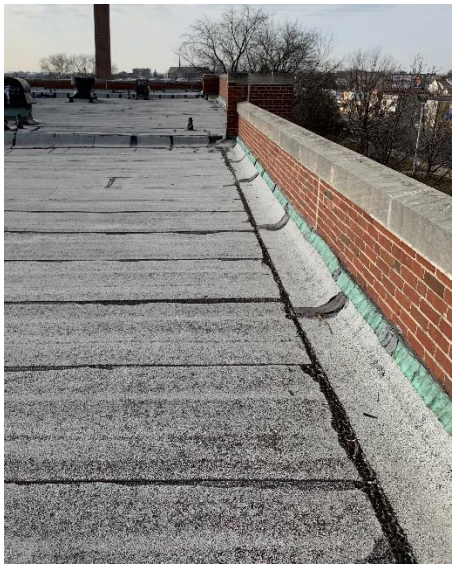
a. Clean and patch granite steps, landing, and walls at the main building entrance with outdoor adhesives and epoxies. Clean out and fill granite cores at handrails with epoxy set to drain. Remove and replace grout and sealant.

IV. Roof

The roof of the main building is a fully adhered build-up rolled asphalt membrane system with impregnated surface granules. At approximately 27 years of age, it is at the end of its expected lifespan. Patched areas show deterioration and ponding with reports of persistent water penetration problems at sections above the auditorium and at the connection to the Annex. Throughout the roof of the main building, tar at seams and curbs is alligatoring.

Roof Patching

Roof Flashing



Roof Coping

Recommended Action:
Remove existing upper roof, flashing and insulation. Replace with torch-applied 2-ply SBS-modified bitumen roofing system, with flashing, counter flashing and coping on insulated substrate sloped to drains. Scope existing roof drain lines and replace existing inlets with new raised inlets to accommodate new insulation. Provide complete metal coping cover over existing stone cap and at the rear portions of the main building, such as over the auditorium, cafeteria and gymnasium, where the parapet is short. Coping should match as closely as possible the stone as it is, and be attached without cutting into the existing stone. Provide brick reglet termination and sealant at the front of the building where the parapet is higher. Replace termination flashing and provide warranty. Evaluate condition of existing parapet and provide for repairs if required. Provide evaluation of lower roofs for applied coating(s) to extend the usable lifespan for twenty five years.

V. Interior Renovations

Recommended Action:

a. Flooring: Existing Terrazzo at main entrance vestibule and steps to be stripped, and cleaned. Patches to be replaced with compatible restoration material and sealed for heavy duty wearing conditions. Grit strips shall be restored for heavy duty wearing conditions.

Terrazzo at main entrance

b. Concrete floor in stairway, bathrooms and teacher storage rooms to be stripped, cleaned, evaluated for staining to improve appearance, and sealed.

Concrete floor in stairway

Concrete floor in storage room.

Concrete floor in bathrooms

c. Existing concrete floor at Boiler Room to be thoroughly cleaned, stripped and sealed.
d. Ceilings: Paint all the ceilings at the areas of damaged Acoustical Ceiling Tiles (ACT) at all main building corridors and Kindergarten Coat Room 100A.

ACT Ceiling Damage @ K Coatroom 100A

ACT @ Corridors

e. Walls: Replace deteriorated wood panel wainscot at main entrance vestibule with a moisture resistant, high impact resistant wall board with trim and grilles to match (or be similar) to existing. Refinish deteriorated wood panel wainscot, baseboard and trim at Kindergarten classroom drinking fountain with marine grade finish panel to match existing.

Wood panel wainscot @ Main Entrance

Wood panel wainscot at drinking fountain

f. Remove all miscellaneous fasteners, staples, and adhesives at CMU walls and repaint CMU walls in the corridors. Do not paint glazed CMU base. Paint

all Corridor and Bathroom walls and ceilings and replace classroom numbers. Provide tack strips at all corridors according to SDP Standards.

CMU block walls @ Main Corridor

g. Doors: Replace high use doors at bathrooms, side pair of auditorium doors with wood doors. Replace Kindergarten classroom double doors with wood doors with vision panel. Replace all other interior doors. Provide ADA accessible hardware at all new doors. Provide rated doors, closers and panic hardware required by code. Remove existing wood panel doors that are non-operational in tracks in main building classroom coat storage closets. Trim tracks for concealment, paint interior wall of coat storage and metal frames. Evaluate cost effective means for enhancing the overhead storage.

Sliding panel doors to be removed

Typical bathroom doors and hardware to be replaced

h. Toilet Rooms: Replace broken or missing toilet accessories with School District Standard.

i. Remove existing chalkboards and replace with 16’-0” of markerboard and 16’-0” of tack board. Retain and refinish existing wood framing, where possible (11 classrooms)

3.4 Structural

A. Existing Building Structure (Main Building)

The existing structure of the main building is a two-story reinforced concrete frame system that also includes one-story high building areas. Classrooms are located along the front portion of the premises at one and two-story high building areas along a doubly-loaded corridor. The building frame system at this portion was implemented as one-way cast-in-place reinforced concrete floor and roof slabs supported by monolithic reinforced concrete beams and girders that frame into rectangular reinforced concrete columns. In addition, one-story high building areas abut and extend from the rear of the main building wing that include the auditorium, gymnasium/playroom, and cafeteria spaces. This portion consists of one-way cast-in-place reinforced concrete slabs supported by clear-spanning reinforced concrete rafter frames. Floor slabs occurring at the exterior grade level for all areas of the building are reinforced concrete slabs spanning over a crawlspace, with the exception of a limited partial basement area at the western end of the main building classroom wing that houses building support mechanical equipment. Building foundations are understood to be implemented as reinforced concrete spread footings bearing on soil at shallow elevations. That support the building columns, basement walls, and grade beam foundations below frost level at perimeter wall locations. All building frame components are understood to be in good structural condition. Exterior walls consist of brick masonry with concrete masonry units at the building interior as multi-wythe building envelope construction.

B. Structure at Building Addition

The proposed addition is anticipated to consist of a two-story building structure for meeting the space planning requirements identified in this report. Current planning for the proposed addition is considering a new building wing projecting perpendicular from the main building area. A partial basement space may be included as an extension of the existing basement space for housing and communicating facility mechanical and electrical equipment supported on concrete pad foundations. It is expected that a passenger elevator will be included as part of the addition that may or may not service the basement level.

It is anticipated that the structure shall be implemented as a column-supported structural steel frame system bearing on a spread footing foundation structure. It is assumed that all floor areas to occur at grade level shall be implemented as conventional soil-supported concrete slabs. Assumptions described here related to the proposed foundation system shall be subject to the findings of a future geotechnical site investigation, to be commissioned by the design professional of record for this project. The building foundation and superstructure elements shall be designed and specified by a licensed professional engineering registered in the Commonwealth of Pennsylvania. Framing systems shall be evaluated by the design team in the course of the schematic design phase of the project. In recent accounts, projects of this nature have been implemented having composite structural steel floor systems consisting of concrete and metal decking on wide-flange steel beam and girder framing supported at wide-flange columns with a consistent column layout occurring at the roof level consisting of open-web steel joists supporting metal roof deck.

3.4 Mechanical/Plumbing

A. Existing Building Observations and Recommendations (main building)

I. *The Original Building Mechanical/Plumbing System (approximately 46,000 SF)*

Plumbing Fixtures – The building is equipped with wall hung urinals (flush valve type), wall hung water closets (flush valve type), and wall hung lavatories with wheel handle faucets. Many of the original plumbing fixtures remain in service, however, these fixtures have reached the end of their service life and should be replaced. New fixtures will provide lower water consumption and provide savings on water heating costs. The bathrooms are also equipped with floor drains. The Annex classroom building is not equipped with any plumbing fixtures or drinking fountains.

There is an electric water cooler located on the first floor and the second floor of the school. A floor standing EWC is located in the teacher's lounge. Drinking fountains are located in the boys and girls toilet rooms that serve the gymnasium. There are drinking fountains located in each of the kindergarten classrooms in the toilet rooms that serve each class. Most appear to be the original installed equipment. The replacement of all drinking fountains with hydration stations is recommended as the equipment is approximately 67 years old and beyond its service life.

Wall hung service sinks are original and are available on the first and second floor for use by the janitorial staff. The sinks appear have exceeded their service life, and should be replaced. The Cafeteria's food prep/kitchen is equipped with one, three compartment stainless steel sink with wheel handle operated faucets and its sanitary connection is served by a floor mounted grease trap. The kitchen is also equipped with a hand sink. The triple wash sink (with wheel handles) and hand sink (with lever handles) show signs of normal usage. The grease interceptor shows no signs of rust or corrosion and is accessible for maintenance. Chemicals are injected manually into the sanitizing basin.

Domestic Water Distribution – It appears that the 3" domestic water service piping is mostly soldered copper. Water service enters the building in the basement, with double check backflow preventer (RPZA – reduced pressure zone assembly) 2" bypass with RPZA and a 3" water meter on the main line upon entering the building. The water meter appears to be new. A dedicated make up water line with a BFP RPZA serves the boiler make up water system. The piping is copper with soldered joints. The distribution piping appears to be original and is at the end of its service life and is recommended to be inspected and repaired as needed.

The previous domestic water generation system has been decommissioned with some components remaining which have been abandoned in place. There are two instantaneous natural gas fired tankless water heaters, Paloma Model PH24-M-DN, at this facility which are located in the boiler mechanical room. Each heater is rated for a maximum gas input of 178,500 btuh, minimum 37,700 btuh. The hot water system is equipped with a recirculation pump as well. The water heaters serve a storage tank. There are recirculation pumps but there is no expansion tank. All water heaters appear to be in satisfactory condition at this time, they were installed in 2007, however they should be replace in the next 3 – 5 years. A water softener was not located for treating the boiler make up water system.

Sanitary Waste - The sanitary waste piping system in the original building is extra heavy cast iron with lead and oakum seals and appears to be the original piping installed in the building. It is therefore recommended to inspect this piping and repair or replace sections as needed. The sanitary system leaves the building by gravity flow.

Rain Water Drainage - The rain water drains from the roof are routed through mechanical chases in the building and connect to the underground site drainage system. There are no overflow scuppers for the building.

Energy Supply - Duplex fuel oil supply pumps provide the required fuel to the boilers when operating on fuel oil. The 12,000 gallon fuel storage tank is located underground at the southwest corner of the school near the boiler room location in the building. The fuel pumps and controls appear to have experienced heavy use, are beyond their serviceable life and therefore should be replaced. A 4" natural gas enters the building in the basement into the main boiler mechanical equipment room. The gas is equipped with a pressure boosting system. The natural gas main is welded, black steel piping while the branches are threaded, black steel.

Heat Generating Systems – Low pressure steam is generated at 15 lbs/sq. in. or less by two 4,043 MBH Weil McLain 94 series steam boilers, model H-1794-WS, with dual fuel burners. All boilers are equipped with Power Flame dual fuel burners, natural gas and number 2 fuel oil, model CR4-GO-30. The boilers were installed in 1991 are 25 years old , however the boilers still have approximately 10 years of remaining service life and do not need to be replaced at this time based on the age of the equipment.. At the time of our survey one boiler had nipples leaks and cannot be run due to this. There is draft control on both boiler flues. Combustion air louvers serve the boiler room to provide combustion air for the boiler operation. Burner controls provide full modulation with electronic ignition, digital flame sensing and pressure atomization on oil. Burner oil pumps are driven by independent motors. The gas train serving each boiler appears to have code required venting of the regulators and dual solenoid valves with venting of the chamber between. The oil supply to the burner is equipped with dual solenoid valves and strainer/disposable media filter.

Distribution Systems – The building steam distribution piping is black steel with welded fittings. .The condensate piping is Schedule 80 black steel with threaded fittings. The piping has been in use beyond its service life and will require more frequent attention from the maintenance staff to address pipe/valve failures as time passes. The District should hire a qualified contractor to examine the distribution piping and perform additional testing to locate and replace any damaged piping and to further quantify the extent of potential failures. The District should budget for replacing this piping over the next 5 years.

The boiler feed water is collected by a boiler feedwater pad mounted system and is treated with a combination of chemicals by a water treatment controller. There are condensate receiver systems in the Annex classroom wing which return condensate back to the boiler feed water tank, typical of six classrooms. The condensate return systems have surpassed their service life and should be replaced. Other building areas return the condensate directly to the boiler feedwater tank and then pumped back to the boiler. The condensate return piping is black steel with threaded joints. The boiler feedwater assembly is equipped with three pumps and a pump control panel. The boiler feedwater system should be replaced as there are signs of rust and corrosion. The steam traps are failing throughout the building as per the building engineer. The boiler feed tank, pumps and associated components are nearing the end of their service life and should be replaced.

Fresh air is admitted into the building through the unit ventilators and by opening windows. Ventilation air is induced into the spaces through the outside air intake grilles located in the building exterior wall which are ducted to the unit ventilators. Unit ventilators and steam convection heat are used for heating in the Annex classrooms as well and are served by the main building's boilers.

The building uses unit ventilators with steam coils in the classrooms and recessed steam convectors in the hallways, at entry ways/exits and stair landings. Sloped top wall mount convector heaters are utilized in the bathrooms. During our survey most steam convection heaters were recessed models, if however there any steam radiators in service without guards or enclosures, these units should be replaced with finned tube convectors to protect students from exposure to the hot surfaces.

The gymnasium is served by recessed unit ventilators without steam coils but with supply and return grilles which are flush with the wall surface. There are also vertical recessed steam convectors which provide heating which are located on the wall opposite of the unit ventilators. Operable windows provide a means of natural ventilation as well. It is recommended to replace these systems with a roof top mounted unit with an overhead supply air distribution system and return air ductwork and low return intake grilles which would be protected from damage.

The cafeteria is served by unit ventilators with steam coils as well as sloped top steam convection heaters. The unit ventilators and convection heaters are part of the original building equipment, have exceeded their life expectancy and should be replaced. Operable windows provide a means of natural ventilation as well. A roof top mounted unit could be provided with heating and cooling coils as well as ventilation to meet the outside air ventilation requirements for the cafeteria seating area. The kitchen is provided with a hood exhaust system for the space. This system should be coupled with a make-up air heating and ventilating supply air system. A kitchen make up air unit should be added as well as a unit to provide heating and ventilation to the kitchen. Proper air flow pressurization and balancing should be performed for the seating area with respect to the kitchen to maintain the kitchen under negative pressurization.

The auditorium is served by an air handler with steam coils, overhead supply air distribution and returns at the rear of the space. Recessed steam convection heaters along the walls provide heat as well. The air handler and convection heaters are part of the original building equipment, have exceeded their life expectancy and should be replaced. Operable windows provide a means of natural ventilation as well. A roof top mounted unit could be provided with heating and cooling coils as well as ventilation to meet the outside air ventilation requirements.

Terminal & Package Units - There are a few which have window air conditioning units but predominantly the building does not have cooling systems. There are roof mounted exhaust fans serve the restrooms.

Controls & Instrumentation - The original pneumatic systems still provide basic control functions. Pneumatic room thermostats drive the unit ventilators, the damper actuators and control valves. Wall mounted pneumatic thermostats on the corridor walls control the steam radiators. There is one air compressor which generates control air for the temperature control system which is located in the boiler room. There is no refrigerated air dryer which serves the compressor. The maintenance staff reports temperature control is generally lacking throughout the facility. Potential problems with oil, moisture or dirt in the pneumatic copper tubing can be one source of problems. The small rubber gaskets and tubing connections at control devices can become brittle over time and fail to compound control problems. The pneumatic systems are beyond their service life and require too much attention from the maintenance staff. The original control valves, dampers and pneumatic actuators are over 67 years old and should be replaced. These controls should be converted to DDC.

A new building automation system (BAS) with modern DDC modules and communications network should be installed to serve the HVAC systems in this building to improve reliability and energy efficiency. An interface should be provided with the preferred system, (currently Bacnet) in use throughout the District.

Sprinklers - The school building is NOT covered by an automatic sprinkler system. Installing a sprinkler system with quick response type heads should reduce insurance costs by providing protection for the property investment. A fire pump may be required depending on the available city water pressure.

3.2 Mechanical Scope of Work

A. Heating Plant

The two original low pressure 4 MM Weil McLain steam boilers, located in the basement that are operational need to be demolished and removed. The SOW listed below encompasses the demolition/removal and replacement of the two original low pressure steam boilers and all associated ancillary equipment, located in the basement boiler room.

1. Demolition and removal shall consist of, but not limited to the following SOW:

    a. The two existing 4,000 MM BTUH Weil McLain low pressure steam boilers located in the original basement boiler room shall be removed along with all appurtenances such as, but not limited to: piping, breeching, condensate pumps, heating tanks, steam tanks, converters, hot water tanks, blow-off tanks, and de-aerators.
    b. Removal of the 12,000 Gallon Fuel Tank, piping and fuel pumps located on the school premises outside the basement boiler room.
    c. One Domestic Water Boiler
    d. Thirty plus/minus Steam Classroom Radiators
    e. Steam Cabinet Unit Heaters.
    f. Exhaust Fans.
    g. Two Circulating pumps.
    h. All existing low pressure steam lines throughout the school, including but not limited to, the boiler room, common areas, classrooms and all ancillary areas.

2. The new Scope of Work (SOW) shall consist of, but not limited to, the following new mechanical work:

    a. Furnish and install 2 each new (skid mounted, if possible) 3,000 /4,000 MBTUH condensing boilers with VFD pumps, hydraulic separator, PRV, control panel and all necessary piping appurtenances to properly heat the existing 2 story 46,000 square foot existing school building and the newly proposed 20,000/30,000 sq. ft. two story addition.

b. Furnish and install two new 5'x10' concrete mounting pads with mounting brackets for each new boiler, if needed.
c. Furnish and install two new 18" diameter CPVC/Stainless Steel combustion air inlet/intake pipe and two new 18" diameter CPVC/Stainless Steel exhaust outlet pipe for each new condensing unit.
d. Furnish and install 40+/- new unit ventilators with wireless control/thermostats for each UV throughout the school and the various classrooms that have malfunctioning. All existing classroom units shall be removed and replaced.
e. Furnish and install one new 200-250 ton air cooled chiller for the existing school and the new addition
f. Furnish and install 3 new 20,000-30,000 CFM AHU's for heating and cooling for the existing school gymnasium, auditorium and cafeteria. Engineer shall provide heating and cooling calculations for the entire existing school and new school areas.
g. Furnish and install approximately new bathroom exhaust fans for the existing school.
h. Furnish and install a new gas tank less water heater(s) for the existing and new school.

B. Piping

The facility has a history of heating/cooling pipe leaks, condensation and failing insulation through moisture saturation of the pipe insulation. Below is a schedule/list of all piping to be replaced with Uponor, Pex "A" (3") diameter pipe or smaller and steel/copper pipe that is greater than 3" diameter, typically installed at the boiler basement location. The EOR shall provide flow calculations for all piping design.

Location	***Length***	***Pipe Diameter***	***Mfg.***	***Comments***
1st Floor Exist. School	550 LF	3" dia.	Pex "A"	Mfg. Uponor w/ 2" Insul.
2nd Floor Existing School	750 LF	3" dia.	Pex "A"	Mfg. Uponor w/ 2" Insul.
1st Floor New School	250 LF	3" dia.	Pex "A"	Mfg. Uponor w/ 2" Insul.
2nd Floor New School	250 LF	3" dia.	Pex "A"	Mfg. Uponor w/ 2" Insul.
Boiler Room	500 LF	6-8" dia.	Copper/Steel Pipe	USA Grade w/ 2" Insul.

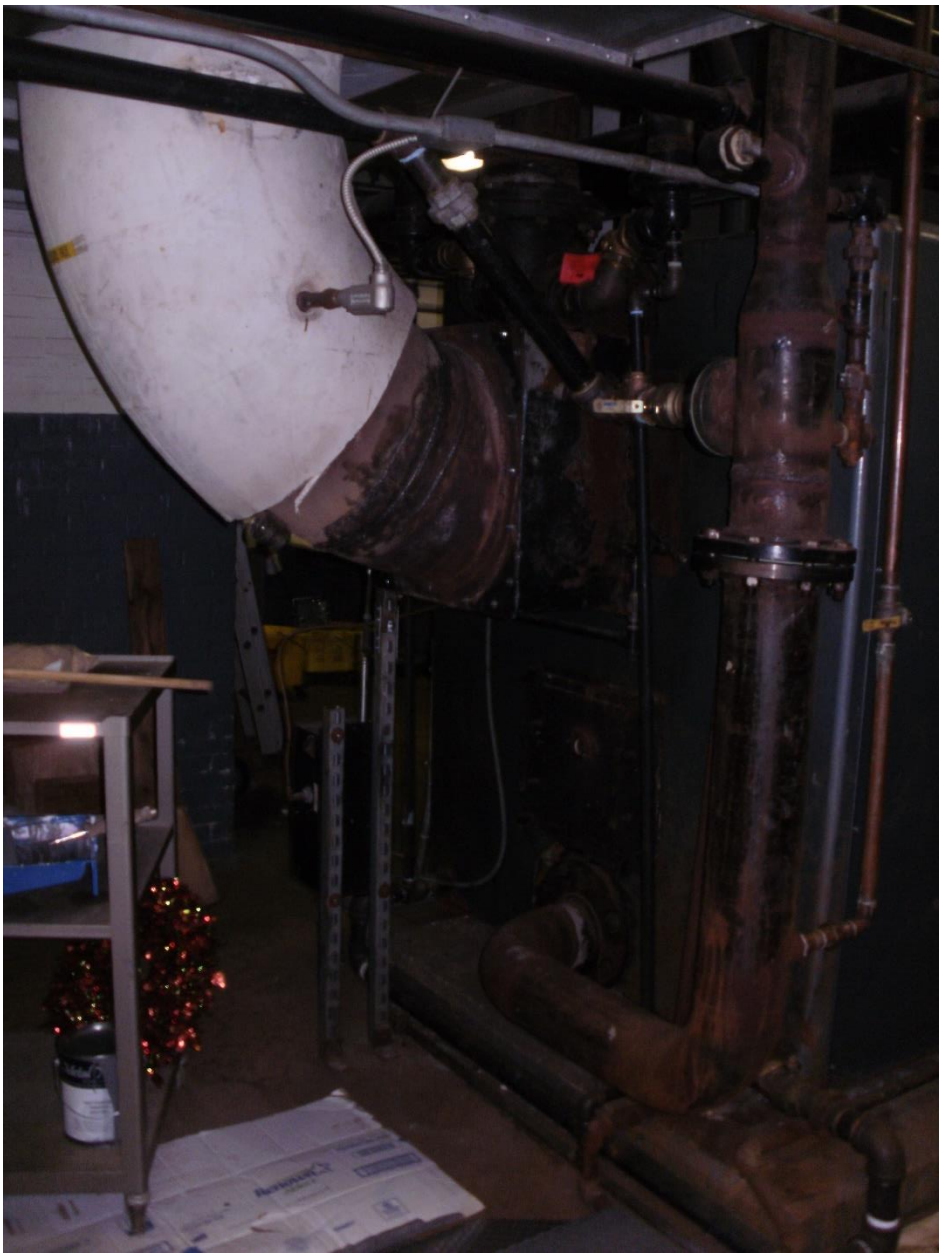
C. Pumps

Replace the 2 pumps with 2 lead/lag pumps for each of the new condensing boilers. Each boiler dual pump package shall be equipped with one Variable Frequency Drive (VFD) controller. This pump package shall be included in the skid mounted condensing boiler package listed above.

D. Mechanical Equipment for the New Addition

1. Furnish and install approximately 12-18 new 750-1250 CFM UV's with outside air louvres per the above SOW for the classrooms of the existing school.
2. Furnish and install new 150-300 cfm exhaust fans for the new bathrooms.
3. Furnish and install a new 9 gpm gas tankless water heater for the new bathrooms.
4. Furnish and install a new sprinkler system for the new addition.
5. Furnish and install approximately 700 lf of new copper lines for the bath rooms and fountains for the new addition.
6. Furnish and install approximately 700 lf of new ductile iron sanitary lines for the new addition.

Steam Boiler



Steam Boiler

Expansion Tank

Louver & Masonry Opening

3.5 Electrical Scope

A. Electrical Service and Distribution

The existing electric service is a 600A, 208V/120V, 3 phase and 4 wire system. The main distribution panel is in working condition. However, this existing electric service will not be able to support the new building addition and the electrical upgrades at the existing building.

Main Distribution Panel

Main Distribution Panel Overcurrent Protection 600A

Insufficient Power Receptacles

Existing AV receptacles for Existing Smartboards

Recommendation:

1. Provide a new electric service at 2000A, 208V/120V, 3 Phase and 4 wire system.

2. The existing 600A electric service shall be relocated to the new electric service.
3. Provide new electrical distribution panels from the 2000A electric service for new loads in the building addition.
4. Provide new receptacle and lighting panels as needed to modernize the existing classrooms per SDP minimum classroom device layout.
5. Modernize classroom with sufficient power receptacles per school district classroom minimum receptacle layout.
6. Retrofit or replace antiquated electrical panels that can no longer be maintained due to lack of parts and components.
7. Provide electrical upgrades to architectural and mechanical modifications in this report.
8. The design consultant shall provide detailed survey, demolition and new work floor plans, riser diagrams and specifications.
9. The design consultant may commission a licensed electrician to assist in surveying existing electric panels to ensure that the final electrical design is feasible while reusing the existing equipment, devices and circuiting. This is a reimbursable service.

B. Lighting

The existing building interior lighting system is mostly fluorescent lights. The exterior lighting system is high intensity discharge type. The exit signs are thermoplastic LED type.

Typical Classroom Lighting @ Main Building

Typical Corridor Lighting @ Main Building

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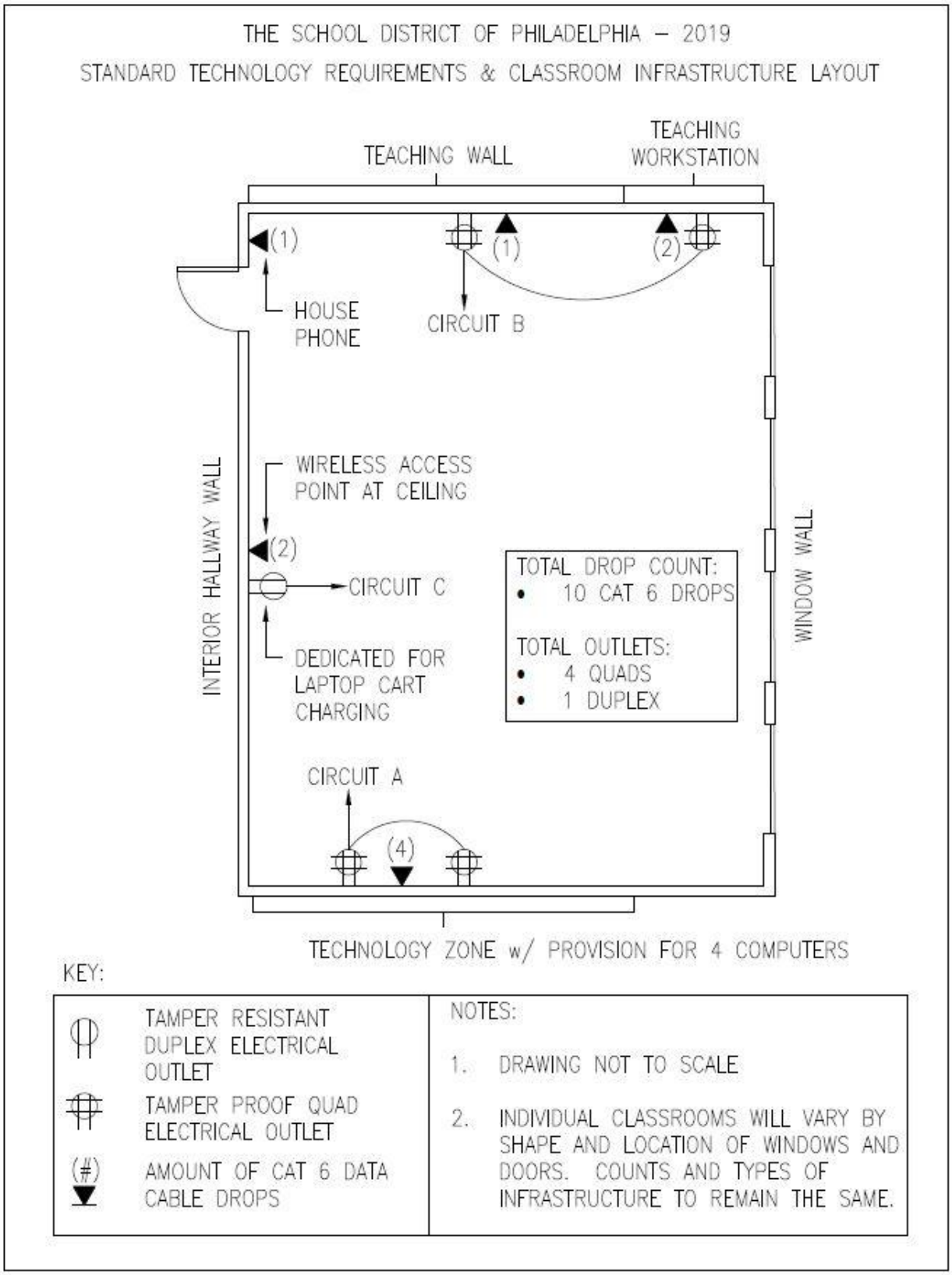
Typical Exterior Lighting

Recommendation:

1. Replace all antiquated incandescent or CFL exit signs with white thermoplastic LED exit signs and connect to generator source.
2. Replace lighting fixtures with new LED lighting fixtures throughout the existing building and provide lighting controls to comply with Philadelphia energy code. Provide generator power to sufficient number of lights in egress path to meet or exceed minimum illumination required by code.
3. Replace the exterior HID's with LED's equipped with integral photocells.
4. Provide new LED's in new building addition with dimmer controls in classrooms. Each classroom shall have minimum 2 lighting control zones. One zone of dimming control over the Interactive Panel Board and rest of the classroom on the second zone of dimming control.
5. The design consultant shall provide detailed survey, demolition and new work floor plans, and specifications.


THE SCHOOL DISTRICT OF PHILADELPHIA – 2019
STANDARD TECHNOLOGY REQUIREMENTS & CLASSROOM INFRASTRUCTURE LAYOUT
TEACHING WALL
TEACHING WORKSTATION
(1)
(1)
(2)
HOUSE PHONE
CIRCUIT B
WIRELESS ACCESS POINT AT CEILING
INTERIOR HALLWAY WALL
WINDOW WALL
(2)
CIRCUIT C
DEDICATED FOR LAPTOP CART CHARGING
TOTAL DROP COUNT:
• 10 CAT 6 DROPS
TOTAL OUTLETS:
• 4 QUADS
• 1 DUPLEX
CIRCUIT A
(4)
TECHNOLOGY ZONE w/ PROVISION FOR 4 COMPUTERS
KEY:
TAMPER RESISTANT DUPLEX ELECTRICAL OUTLET
TAMPER PROOF QUAD ELECTRICAL OUTLET
(#)
AMOUNT OF CAT 6 DATA CABLE DROPS
NOTES:
1. DRAWING NOT TO SCALE
2. INDIVIDUAL CLASSROOMS WILL VARY BY SHAPE AND LOCATION OF WINDOWS AND DOORS. COUNTS AND TYPES OF INFRASTRUCTURE TO REMAIN THE SAME.

A. Fire Alarm System

The existing fire alarm system is a coded system. This fire alarm system is antiquated and should be replaced.

Typical Fire Alarm Gong and Typical Fire Alarm Pull Station

Recommendation:

1. Provide a new fire alarm voice evacuation system including detection devices and notification devices per code. Demolition of existing fire alarm system shall start after the new fire alarm system is accepted and certified.

2. Extend the new fire alarm system into the building addition with a new addressable voice evacuation fire alarm system including control panel, remote power booster panels, pull stations, speaker/strobes units, smoke detectors, duct detectors, heat detectors, fire alarm wiring, power wiring, remote annunciator panels, etc.
3. The new fire alarm system shall come with 3 years of warranty, maintenance service and re-certification.
4. Provide pull stations in high ceiling areas like auditorium and gymnasium in lieu of smoke or heat detectors on high ceiling.
5. Provide pull stations in Main Office, Building Engineer's Office and Boiler Room. The new pull stations shall include a high impact cover (STI) with local alarm by battery.
6. Where heat, smoke or duct detectors are installed in areas that are not readily accessible such as high ceiling, provide remote test switches at location readily accessible to faculty only.
7. Where heat detectors are installed in mechanical or boiler rooms, the heat detectors shall be conventional type and with weather proof covers.
8. The design consultant shall provide detailed survey, demolition and new work floor plans, riser diagrams and specifications.

B. Security System

There is a designed surveillance system in 2018. The anticipated surveillance system installation is 2019.

C. Telecommunication System

Wireless access points were installed in classrooms. However, the classrooms lack hardwired CAT 6 connections per SDP classroom minimum device layout.

Recommendation:

1. Provide telecommunication upgrades including CAT 6 connections in existing classrooms based on school district classroom minimum layout.
2. Provide 2 CAT6 connections at each new office workstation and 1 CAT6 connection per each classroom computer.
3. Construction documents and specifications shall adhere to school IT design guideline and specifications.
4. The contractor shall be responsible for installation of conduits, cables, patch panels and including all terminations and labeling. The contractor shall provide all testing reports to the IT department for record keeping.
5. The design consultant shall provide detailed survey, floor plans, riser diagrams and specifications.

D. Synchronized Clock System

The existing master clock system is not functioning properly.

Recommendation:

1. Provide a new wireless clock system in the existing building and the new building addition. The basis of design shall be Sapling, Primex or approved equal.
2. All clocks shall be battery operated and be at 900MHZ.

3. New wireless clocks shall be installed in classrooms, gym, cafeteria, main office, and conference rooms. Provide wireguards for clocks in gym.
4. The design consultant shall provide detailed survey, floor plans, riser and specifications.

E. Phone, Public Announcement and Bell System

The existing phone, public announcement and bell system is operational.

Typical Decommissioned PA Stainless Steel Speaker
Typical Square PA Speaker Currently In Use

Recommendation:

1. Construction document shall illustrate where the space is architecturally altered and require the PA speakers to be removed and reinstalled to allow for that modification.
2. Provide new PA speaker system in the new addition and connect to existing PA system.
3. Remove any phone and PA speaker that was decommissioned and abandoned.
4. Provide new phone and PA speaker replacements as needed.
5. The design consultant shall provide detailed survey, floor plans, riser and specifications.

F. Existing Generator System

The existing natural gas generator is a 15KW, 120/240V, 1 phase and 3 wire system and is antiquated. There is not enough working clearance around this generator per NEC.

Existing Generator, Emergency Panel and ATS

Recommendation:

1. Provide a replacement generator rated sufficiently to provide emergency and any desired standby power to existing building and new building addition. The generator KW size shall be 25% greater than the calculated generator loads.

END OF SCOPE DETERMINATION REPORT