



## Halifax Area School District

Elementary School Facilities Assessment  
January 24, 2017

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January 24, 2017

Michele M. Orner, Ed.D.  
Superintendent  
Halifax Area School District  
3940 Peters Mountain Road  
Halifax, PA 17032

Dear Dr. Orner:

On behalf of everyone at KCBA Architects, Snyder Hoffman Associates, K&W Engineering, and Landmark Commercial Realty, I would like to thank the board, administration, and faculty of the Halifax Area School District for the opportunity to undertake this elementary school facilities study. We hope this report will be a helpful tool to advance your district's understanding of the existing conditions of your facilities and the potential alternatives to meet your long-term needs.

The HASD team tasked KCBA with reviewing the condition of your buildings and their suitability to support your 21<sup>st</sup> century educational program. As detailed in the following pages, we found the two existing elementary school buildings – Enders-Fisherville Elementary School and Halifax Elementary School – to be in fair to poor condition. In each case, the buildings are near the end of their functional lifespan and require full renovation, restoration, or decommissioning.

Our study has explored multiple scenarios to address the current buildings' inequities in meeting both your long-term operational and programmatic needs. These range from a baseline restoration and maintenance upgrade of the existing buildings to a more sweeping renovation/expansion project to the construction of a new consolidated K-5 school on various sites within the district. In addition to construction feasibility and construction cost of the different scenarios, as part of this effort we also examined district demographic data as well as real estate evaluations of the two existing school properties. Much of our findings from this component of our study are included in the accompanying slide presentations that were originally presented to the district on December 6, 2016 and January 24, 2017.

Our team looks forward to continuing our collaboration as you work toward identifying the best strategy for the future of elementary education in Halifax Area School District.

Sincerely,

A handwritten signature in black ink that reads 'Michael Kelly'. The signature is written in a cursive, flowing style.

Michael Kelly, AIA, LEED AP  
Principal



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Existing Facilities Report – Enders-Fisherville Elementary School  
791 Enders Road, Halifax, PA 17032

**History:**

Enders-Fisherville Elementary School (EES) was originally built in 1958 with alterations and additions completed in 1988 and 2002.

The building is located on a relatively flat 10.2 acre site in Jackson Township, about 6.2 miles outside of the Borough of Halifax.

**Building Statistics:**

Size of Building:

Building 26,995 square feet (SF) (1 story building)  
Modular Classroom: 1600 SF

Grades: The school currently educates students from Kindergarten through 1<sup>st</sup> grade. EES provides autistic and special education within the building and also relies on a consortium of school districts to provide these services to the community.

In September 2016, **160** students were enrolled at EES.

**Site:**

Vehicular Circulation & Parking: The bus drop-off/pick-up area is located along the front (or west) side of the building, with the buses lining up "single file" on the existing looped drive. Based on information from the District, only five buses service this school and sufficient space is available to stack all of them along this access drive. Note that only a small area of sidewalk exists along the bus loop (along the southwestern facing wing by the main entrance) such that students must walk on the driveway or in the grass area when walking to/from the buses. Parent drop-off/pick-up occurs at the rear (east side) of the school in an area which is fairly small and can cause congestion (i.e. vehicles back up to the main driveway along the south side of the building) while also infringing on the hard surface play area. Parking is limited to 38 striped spaces along the southern access drive and loop road along the western side of the building, while overflow parking occurs in the hard surface play area behind the building for larger events.

Sight distance is poor for both of the driveways entering/exiting Enders Road, particularly with respect to potentially high speeds



*Exterior of building*



*Aerial view of site*



*Front of school with bus drop-off area*

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*School entrance and bus loop*



*Looking east at paving (note rock lined stormwater facility behind curb at right)*



*Stormwater management basin*

(due to the rural nature of Enders Road) and the relatively slow turning movement of a school bus (particularly when exiting).

Sidewalks and Paving: The sidewalk along the front of the school appears to be in good condition and provides a flush section to allow for handicap access (though the ramping in this area may not be ADA compliant with respect to areas of flat walkway beyond the limits of the ramp). The concrete curbing along the described sidewalk appears to be in satisfactory condition. There is a bituminous curb along the southern most parking spaces that has cracks in numerous locations allowing vegetation to grow between the curb and the paving itself (which may or may not have been intentional in order to allow drainage to pass through the curb into the stone-lined area behind). Sidewalks along the rear of the building are nominal and solely provide access from the edges of paving to the modular building entrances located on this side. There is no curbing on the back (or east) side of the school. Paving across the site generally appears to be in satisfactory condition with some areas of cracking.

Storm Water Management: There is a single detention basin at the northeast corner of the building which was likely constructed in conjunction with the modular units. No pipes were observed discharging into the basin but it appears that some of the roof drains on this side of the building may discharge at grade and sheet flow into this basin. There did not appear to be any storm sewer inlets along the front or back side of the building. This basin discharges to a level spreader that overflows to the adjacent grade and runs towards the northern portion of the site. There is also stone bed/trench just behind the bituminous curb located along the southern most parking spaces which may be utilized to collect surface stormwater runoff from the adjacent parking area/driveway (no discharge of any kind was observed from this facility).

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*Soft surface play area*

Play Areas: A large “soft surface” play area with multiple pieces of play equipment is located on the east side of the school. The equipment and the overall state of the play area appears to be in good condition (note that there is no fence surrounding this play area). A “hard surface” play area is located between the soft surface play area and the school (note that this area is also used for daily parent drop-off/pick-up and appears to accommodate overflow parking for large events). This paved area is in satisfactory condition with two basketball hoops and backboards on either end. There is a utility pole and guy wire located just off the edge of the south side of this play area that can present safety concerns for students at play.



*Hard surface play area and utility pole*

Additional Comments: The site is served by on-lot sanitary sewer (underground septic system) and water (well) systems. Surface evidence of a septic system can be seen just to the northeast of the modular units behind the school (it is unclear if that is the only system on the site and/or if it serves the entire property). According to District staff, loss of water pressure and/or inadequate flow is routinely experienced based on intensity of usage (i.e. if too many toilets are flushed at the same time before/after lunch or recess). The uncertainty about the septic system size/capacity/condition and water pressure/capacity inadequacies will likely require significant investigation and could present design challenges should additional student/staff population be introduced at this site (i.e. can a well with sufficient pressure/capacity be located on site, will holding tanks/pumping be required to meet fire suppression and routine domestic usage, will a new septic system be required, can a ‘sand mound’ type system be utilized, or will some type of package treatment system be necessary and where will such a system discharge).



*Exterior equipment*

Note also that there is a large communication antenna located adjacent to the northwestern corner of the building. It also has several ground support posts that are situated in open grass areas.

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Detail of existing brick



Detail of existing sill deterioration



Brick/EIFS/Fenestration

**Building Exterior:**

Facade: The exterior facades are primarily brick veneer with CMU backup. Areas of glazing have been infilled with EIFS on most of the perimeter. There are many areas where surface deterioration is evident. Many of the window heads have deteriorating flashing. Caulking around windows and at control joints are showing signs of aging in a majority of areas. Exterior lighting is outdated. In general the exterior is in fair condition with areas of poor condition noted.

Issues to consider:

EES.EX.01 Repoint exterior brick.

EES.EX.02 Repair deteriorating sills.

EES.EX.03 Replace exterior lighting.

Fenestration: Windows are in poor condition showing signs of age and are in need of replacement. Several of the frames and glazing had been modified to accept window A/C units. Exterior window sills show signs of water infiltration and damage. The window frames and seals have exceeded their life cycle. Some exterior doors were not well protected and show signs of damage.

Issues to consider:

EES.EX.04 Replace windows as required.

EES.EX.05 Replace damaged exterior doors.

Roof: Access to the roof was not available during our visit. A portion of the roof was replaced in 2010 due to storm damage, primarily over the multi-purpose room. Flashing was generally bent and compromised at the roof edge, sustained winds on the site exacerbate the issue. Signs of water infiltration were noticed in the ceilings.

Issues to consider:

EES.EX.06 Replace perimeter flashing.

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View of main entrance corridor

**Building Interior:**

Flooring: Most of the corridors in EES have VCT flooring. Classrooms are a mixture of full carpet, full VCT, or a combination of both. These are in fair condition. The library is primarily carpet with an adjacent room of VCT. The nurse room is carpet. The main entry is VCT and the front office is carpet. In most locations the floors are in fair condition showing signs of aging.

Issues to consider:

**EES.BI.01 Repair damaged flooring and base.**



Classroom flooring

Walls: The interior walls are primarily painted CMU. There is a wood accent wall and display case at the entry. The main entry hall has a large tile mosaic that is original to the school, the district desires to preserve the mural. Areas of glazing that have been infilled with EIFS are primarily finished with a tackable surface in the classrooms. Cracking was noticed in some walls.

Issues to consider:

**EES.BI.02 Repair cracks throughout building.**

**EES.BI.03 Consider providing protection to wall mosaic.**



Mosaic to be preserved

Ceilings: Ceilings through most of the corridors and classrooms are acoustical ceiling tiles. Most of the lighting in these spaces are lay-in fluorescent. In most locations the ceilings are in fair condition showing signs of age. A minimal amount of ceiling tiles are damaged and in need of replacement. The bathroom ceilings are primarily GWB.

Issues to consider:

**EES.BI.04 Replace damaged ceiling tiles.**

Food Service: It was noted the kitchen equipment is old and in fair to poor condition. The kitchen area is generally in fair to poor condition. Ceiling tile, floor tile and walls are dated. The student cafeteria is a triple use space, also serving as the gym and auditorium. The students enter one serving line from the main corridor and discharge into the main seating area. Student tables are folded up to accommodate other uses and there is limited storage. There is a faculty dining room in the

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Approach to restroom

building but it is not near the administration suite. Deliveries are received adjacent to kitchen area.

Issues to consider:

EES.BI.05 Consider replacing kitchen equipment + renovating kitchen.

EES.BI.06 Consider adding storage to triple programmed space

Code Compliance: Exterior access points are on grade and appear to be handicap accessible.

Door hardware into classrooms and storage areas are not ADA compliant and there are issues throughout the building with restricted approach.

Sinks within classrooms do not meet ADA requirements.

Water fountains are not handicap compliant.

There is no building-wide fire suppression system (sprinklers).

Issues to consider:

EES.BI.07 All hardware and fixtures should be replaced with equipment compliant with current ADA requirements.

EES.BI.08 Any future renovation should include the installation of a building-wide fire suppression system.

Security: There is no secure vestibule although visibility of the entrance from the office is good. There is only one set of bathrooms in the facility requiring students and visitors to share the same facility.

The doors and door hardware into many classrooms are not sufficient for modern security standards. Teachers should have the ability to lock their classrooms from the inside.

Issues to consider:

EES.BI.09 A singular main entrance to the school should be made secure by routing visitors into administration offices prior to gaining entry to the main building.

EES.BI.10 Doors and door hardware into classrooms should be replaced with more secure devices.

EES.BI.11 Non-student restrooms should be provided.



Classroom sink



Entrance vestibule opens directly to corridor

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Typical classroom

**Educational:**

Classrooms: Classrooms in the building are rightsized, although the attached restrooms have accessibility issues. Several of the classrooms are not being used to capacity and several rooms are used for other activities. Classrooms typically have projectors with smart boards that were repurposed from other school renovations. Casework in classrooms is in fair to poor condition and do not meet accessibility requirements. It was noted several rooms are underused during parts of the day. In general, classrooms are in fair to poor condition and have adequate natural light.



Computer lab in modular

Issues to consider:

**EES.ED.01 Create accessible bathrooms, sinks, and storage in classrooms.**

Group Instruction: There are no individual small group instruction areas in the school. The school does not have a large group instruction space.

Issues to consider:

**EES.ED.02 Rightsized small group instruction areas should be created.**

**EES.ED.03 Consideration should be given to creating a large group instruction space.**



Occupational therapy in modular

Special Education: The school currently has two special education classrooms. One is in a full size classroom and the occupational therapy room is in the modular portion.

Issues to consider:

**EES.ED.04 Consideration should be given to creating rightsized classroom spaces for special education and abandoning the use of a modular classroom.**

Music/Art: There is currently one room for art and one room for music, they are located in a typical classroom. Music and art teachers move between HES and EES, so for half of the day the rooms are not utilized.

Science/Technology: There is a dedicated room for the computer lab within the modular classroom. Several individual

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*Multi-purpose room with stage*



*Multi-purpose room with stored tables*



*Existing mechanical room*

computer stations are set up in each classroom. There is no dedicated science classroom in the school.

Issues to consider:

**EES.ED.05** Consideration should be given to providing each student with an iPad or laptop. These could be stored on mobile carts or within each classroom.

**EES.ED.06** A dedicated space should be created for science education.

Physical Education: The multi-purpose room acts as the school's gymnasium, cafeteria, and auditorium. There is a small storage room adjacent the multi-purpose room. The room does have a slightly elevated stage which did not appear handicap accessible.

Administration: The administration suite is not directly linked to a secure vestibule. The suite itself is undersized and the circulation causes users to pass from one room to another. The nurse suite does not have a separate room for exams but uses a curtain to partition off the area. The nurse suite has unsuitable flooring.

Issues to consider:

**EES.ED.07** The main office should be extended to the front lobby to create a secured entrance protocol.

**Building – HVAC:**

**History:**

The building was constructed in 1958 and underwent a renovation and addition in 1988. With exceptions, a majority of the HVAC systems are 18 years old and are nearing the end of their useful lives.

**Central Heating Plant:**

The boiler room contains two Weil McLain 588 oil-fired cast iron hot water boilers that were installed in the late 1990's. Base mounted pumps distribute the heating hot water through the building in insulated copper piping. The pumps are in need of replacement (one has had a motor replaced). Vertical piping

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contained in concealed locations or drops within existing block walls are most likely original to the building. An underground fuel oil tank is located outside of the boiler room. A leak detection system is present. Each boiler's breeching has a barometric draft control damper. An automatic glycol feed system is present in the heating water system. The Webster burners are functioning adequately. The outside air intake for the boiler room does not have an interlocked control damper on it and it is currently blocked. The ASHRAE Median Service Life for the boilers and burners are 35 and 21 years respectively. The boilers themselves appear to be in fair condition but other components of the system are overdue for replacement.

**Central Cooling Plant:**

The school does not have a central cooling plant. Air conditioning is provided by through wall packaged terminal air conditioning units (PTAC's) in select locations.

**Unit Ventilators:**

A majority of classrooms and educational spaces are heated and ventilated with horizontal unit ventilators on the exterior walls. The unit ventilators receive outside air through a louver just above grade on the exterior wall. Each classroom has a relief air grille. Individual space temperature control is provided for heating only. The unit ventilators do not have DX coils and have no means for dehumidification. The ASHRAE Median Service Life for unit ventilators is 15 years. The units have exceeded their useful lives and should be considered for replacement in the near future.



Auxiliary air conditioner at multi-purpose room

**Auxiliary Cooling:**

Several spaces, including some of the administration suite spaces, the server room, the cafeteria and select classrooms have through wall packaged terminal air conditioning units (PTAC's). Outside of the administration suite these units are technically through-window units. The district noted that certain students have medical conditions that are exacerbated at higher temperatures so the PTAC units move around the building annually with the students. The PTAC's provided to condition

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the cafeteria are inappropriate and inefficient for such a large space. Ceiling fans are present in some classrooms to assist in ventilation.

### **Kitchen Exhaust:**

The kitchen has a single-sided exhaust hood backed up against a partition wall. Make-up air was not observed and is presumed to be transferred in from the adjacent cafeteria. The kitchen hood is exhausted by a fan on the roof. An ANSUL fire suppression system is not present within the hood although the equipment located underneath the hood does not appear to require integral fire suppression. The dishwasher exhaust hood has been disconnected; it is not clear if the existing dishwasher is currently still in use. The ASHRAE Median Service Life for the exhaust fans is 15 years.

### **Terminal Heating Equipment:**

Terminal heating equipment such as convectors, cabinet unit heaters, and unit heaters are present to heat auxiliary spaces such as toilet rooms, vestibules, mechanical rooms and storage rooms. The ASHRAE Median Service Life for the heaters range from 20-25 years.

### **Exhaust Air Systems:**

In addition to the kitchen (described above), toilet spaces, select storage spaces, and janitor's closets are exhausted through ductwork to rooftop exhaust fans. The art classroom does not have exhaust provisions which is required for International Mechanical Code compliance. The ASHRAE Median Service Life for exhaust fans is 20 years.

### **Ductwork Systems:**

The exhaust air ductwork is galvanized steel sheet metal. Minimal ductwork is located within the school. The ASHRAE Median Service Life for ductwork is 30 years

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**Automatic Temperature Controls:**

The ATC system is not fully integrated. Air conditioning units are controlled separately from the heating units. Remnants of a Siebe Environmental (now Invensys) system are on site.

**HVAC RECOMMENDATIONS:**

EES.HVAC.01 The boilers are in fair condition but the auxiliary systems associated with the central heating plant are in poor condition and should be replaced.

EES.HVAC.02 The exhaust fans are nearing the end of their useful lives and should be replaced.

EES.HVAC.03 The dishwasher exhaust system (if still active) should be extended to connect to the hood. At minimum a capture hood should be provided.

EES.HVAC.04 A proper intake sleeve and ATC interlock damper should be provided for the boiler room outside air louver.

EES.HVAC.05 Exhaust should be provided for the art classroom to provide the ventilation rates required by the International Mechanical Code.

EES.HVAC.06 The burners and fuel oil duplex pumps show signs of oil leakage and should be replaced. They are near the end of their projected life cycles. Additionally, blending pumps should be provided to prevent thermal shock and extend the lives of the boilers.

EES.HVAC.07 A fully integrated DDC ATC system should be considered.

EES.HVAC.08 The classroom unit ventilators cannot provide cooling, cannot dehumidify, and distribute air poorly. The units are outdated by today's standards for indoor air quality in an educational environment and should be replaced.

EES.HVAC.09 The PTAC in the server room should be replaced with a ductless split system.

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**Building – Plumbing:**

**History:**

The building was constructed in 1958 and underwent renovations and additions in both 1988 and 2001. With exceptions, a majority of the plumbing fixtures and equipment are original and are nearing, or have exceeded, the end of their useful lives.

**Plumbing Utilities/Services**

**Domestic Water Service:** The building's domestic water supply is served from an on-site well with a Well-X-Trol storage tank located in the existing boiler room. Adjacent to the existing storage tank there is a carbon base storage tank and a gravel base storage tank and a chlorine injection system located on an adjacent wall for domestic water service disinfection. Regular sampling and bacteriological testing is performed by the school district and has indicated the water is safe for human consumption. No backflow preventer was observed on the incoming water service piping with the exception of a single check valve downstream of the water disinfection system. The existing Well-X-Trol tank appears to have replaced an existing hydro-pneumatic tank. The entire system appears to be functioning within normal parameters and has been reported by the school district to be in fair/good condition with regular testing performed in accordance with ASME regulations.

**Septic/Sewage:** The building drainage system is served by an on-site septic system. The school district has reported that there are no known issues with the on-site septic system since they have added some additional treatment to the system. There is an alarm when it is time for the system to be pumped so the system has been maintained with a regular pump out schedule.

**Natural Gas:** Natural gas service is not available at this site. Oil is used as the primary heating fuel with a propane tank for the emergency generator.

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### Plumbing Equipment

**Domestic Water Heating:** The existing domestic water heating system includes a single oil-fired water heater located in the boiler room. The water heater replaced the original hot water generator possibly when the district installed the oil-fired cast iron boilers in the late 1990's. The water heater appears to be in fair condition considering its possible age. Hot water is delivered to the building at two temperatures, 140 degrees Fahrenheit to serve the Kitchen equipment and 110 degrees Fahrenheit via a thermostatic master mixing valve to serve the remaining building fixtures. Only one recirculation pump was observed sitting on an old metal chair. The existing recirculation pump appears to be in good condition but it is not properly supported. Since the water heater is within close vicinity to the kitchen, the kitchen hot water is not recirculated.



*Original plumbing fixtures*

**Plumbing Fixtures:** Most of the plumbing fixtures appear to be original with some replacements during the renovations and in most cases are in poor condition. There are no ADA/Accessible fixtures based on the current regulations. Most faucets are not provided with low flow as required by the current plumbing code. Also, tempering valves required by current IPC plumbing codes at public handwashing lavatories have not been installed. Most flush valves are old and it is likely that the flushing volume is more than 1.6 gpm.

### Plumbing Drainage Systems

**Sanitary Drainage:** The below slab sanitary drainage piping serving the building was primarily installed during the original 1958 construction with some modifications. The age of the below slab piping is approximately 58 years and could experience condition issues. The school district has reported no issues or problems associated with the building's sanitary drainage systems with the exception of backups occurring when the on-site septic system requires pump out. Cleanouts to facilitate drainage piping maintenance were observed. A grease trap was installed within the kitchen area and connects to drainage piping serving select kitchen equipment. The grease trap is steel construction and appears to have been installed during the original construction of the building in 1958 but that has not been verified. The school district reported no known

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condition issues with the existing grease trap at this time and it is unknown if the grease trap is emptied and properly maintained on a regular basis.

There is a sump pump located at a lower elevation in the boiler room. It is unknown, at this time, if the pump discharges to storm or sanitary drainage. The age and condition of the pump is also unknown but there have been no reported failures by the school district.

**Roof Drainage:** The roof drainage system is composed primarily of roof drains and interior rainwater conductors. The school district reported no issues or problems with the roof drainage system and has recently had a scan done of the existing roof. The results of that test were not available for this report. Cleanouts to facilitate storm drainage piping maintenance were observed. Existing roof is composed primarily of parapet roof construction and no emergency rainwater drainage system has been installed

**Plumbing Water Supply System:** The domestic water supply piping serving the building is primarily copper and for the most part appears to be original to the building. Corrosion was observed with some of the gang toilet and boiler room piping. The school district has not reported any major failures with the existing water distribution piping system. Existing piping system and fixture trim was installed prior to enactment of the 2011 “Reduction of Lead in Drinking Water Act” which has set stricter standards for lead content in materials used within potable water piping systems.

**Fire Protection:** An Automatic Fire Suppression Sprinkler System has not been installed within the existing building.

**PLUMBING RECOMMENDATIONS:**

EES.PLUM.01 Existing domestic water service should be provided with IPC compliant/ASSE certified backflow preventer located immediately at service entrance.

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EES.PLUM.02 Consideration should be given to replacing the existing Well-X-Trol storage tank with a gravity tank and variable speed booster pump system for better flow and pressure.

EES. PLUM.03 Consideration should be given to upgrading the current domestic water disinfection system to current PA DEP standards including contact time requirements. Existing water service piping should be replaced with corrosion resistant materials at chlorine injection locations.

EES. PLUM.04 The existing domestic water heater appears to have exceeded its life expectancy and should be replaced. With replacement of the water heater, a new tempering valve compliant with current ASSE requirements should be provided and installed in a location facilitating easy inspection and maintenance. Existing recirculation pump and piping should also be re-worked to provide proper support.

EES. PLUM.05 Overall most plumbing fixtures are in poor condition and should be replaced with new low flow fixtures and low lead compliant faucets. Renovations to the toilet rooms should address any ADA/Accessibility issues as well as current water conservation requirements and the "Reduction of Lead in Drinking Water Act". Remaining fixtures should be updated to ANSI A117.1/ADA compliant accessible fixtures as part of any future renovation. Consideration should also be given to providing ASSE certified tempering valves at handwashing fixtures for scald protection as required by current plumbing codes.

EES. PLUM.06 Condition of the existing grease trap should be monitored and replaced with HDPE corrosion resistant grease trap if necessary. During any major kitchen renovation, consideration should be given to replacing interior grease trap, if possible, with an exterior grease interceptor to provide easier and more sanitary maintenance and cleanout.

EES. PLUM.07 Condition of existing below slab sanitary drainage piping should be verified via video scoping of existing lines and replaced as part of any future renovation as determined necessary by the scoping.

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EES. PLUM.08 Requirements for emergency rainwater drainage system should be verified based on structural loading capacity if water is ponding on the roof. Provisions for emergency rainwater drainage should be made to existing roof drainage system if required by roof construction and the inability of the roof to handle the amount of water that would pond on the roof before it could spill over any parapet walls or edges of the roof. Some parapet walls were observed.

EES. PLUM.09 Potable water system should be tested for lead. Lead reduction filters should be installed at all drinking fountains and potable water outlets intended for human consumption as required based on test results.

EES. PLUM.10 Review condition of any existing emergency/safety plumbing fixtures and correct deficiencies as required. Verify that all emergency/safety fixtures are routinely tested as required by ANSI Z358.1 and OSHA.

EES. PLUM.11 Provide emergency/safety plumbing fixtures in any area where caustic, corrosive or injurious chemicals are used or dispensed in accordance with OSHA regulations and ANSI Z358.1. Review MSDS information to determine required emergency fixtures. Possible locations could include boiler room with chemical treatment equipment and janitor/custodial closets.

EES.PLUM.12 Consider addition of an automatic fire suppression sprinkler system or alternative fire resistant building construction during any future renovations or building additions. However, due to the lack of public water supply, it may not be feasible to add a sprinkler system to this building.

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**Building – Electrical:**

**Summary:**

The building was constructed in 1958 and underwent renovations and additions in both 1987 and 2001.

**Electrical Distribution:**

The electrical service is located in the boiler room. The service originates from a single PPL Energy pole mounted 100KVA transformer then drops down the pole and is routed underground into the building. The building power distribution originates from a 120/240V, single-phase Siemens panelboard with a 600amp main breaker. The large majority of panelboards throughout the building were replaced in the 2001 renovation with the exception of the generator distribution panels which were installed in 1987 and the stage panel which is an original Federal Pacific panel in poor condition. The electrical equipment does not have National Electrical Code (NEC) required Arc Flash warning labels. It was noted that power outages occur at the building frequently on average of approximately once per month.

The average classroom contains four receptacles (two front of room and two back of room); the modern standard is six to eight receptacles per classroom. GFI devices were noted near sinks and in the kitchen in compliance with NEC code.

**Lighting System:**

Typical classrooms consist of recessed 2X4 troffers with 4-lamp, T8, 32W, fluorescent lamps and Holophane 8224 glare reducing lenses. Measured lighting levels in the typical classroom in the building addition range from 50 to 95 foot-candles which is acceptable for the classroom environment. The classrooms contain two line-voltage switches controlling half of the fixtures each but do not utilize occupancy sensors for automatic shutoff.

The corridor lighting utilizes 1X4 prismatic 2-lamp, T8, 32watt fluorescent lamps and are controlled by line-voltage switches with no automatic shutdown control.

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The gymnasium/cafetorium utilizes 2X4, 4-lamp, fluorescent, prismatic lensed troffers and are controlled by line-voltage switches with no automatic shutdown control.

Some incandescent lighting was observed in the boiler room and storage rooms.

Building mounted lighting switches do not meet the American with Disabilities Act (ADA) requirement of 48" maximum height.

A few battery packs were also observed for emergency lighting in the group toilet rooms.

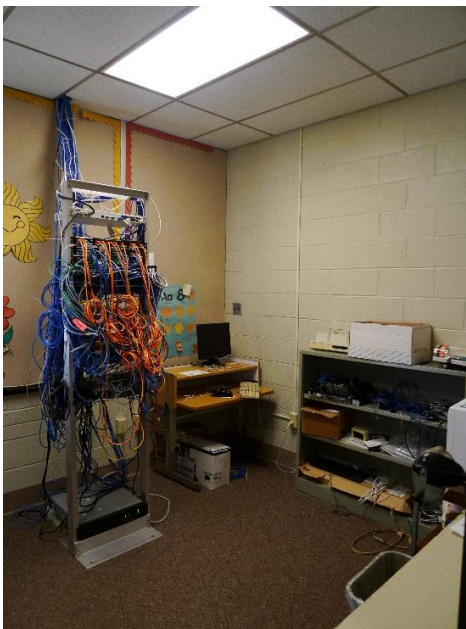
Building exterior lighting consists of a mixture of HID fixtures and LED wall mounted fixtures. Parking and driveway lighting is not sufficient to meet Illumination Engineering Society of North America (IESNA) recommendations. Some of the building mounted fixtures were illuminated during the site visit indicating some of the photo sensors are either failing or need adjustment. The HID building mounted fixtures are in fair condition and are maintainable. The LED fixtures are in good condition.

**Emergency Generator System:**

The emergency generator is located inside the boiler room. This is a Kohler 5KW, 120/240V, 1-phase propane unit which was installed in the 1987 renovation. The emergency distribution has one automatic transfer switch (ATS) in the electrical room and feeds only life-safety loads from the single transfer switch. The ATS Controller was just replaced in September of 2016. The generator system is in poor condition.

**Data/Network System:**

The Main Distribution Frame (MDF) for the building is located in a room adjacent to the teacher's lounge central to the building. The data rack is a full height two post rack without wire management. The building wiring solution is Cat 5E. The MDF is of sufficient size for the rack however wire management should be added for the many cables on the rack. No additional network equipment was observed in the building.



Existing server room

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Typical classrooms have a WiFi access device on the ceiling and three to five data drops in one corner. It was noted that many of the data drop were installed in surface mounted boxes which are no longer secured to the wall and with loose covers. These conditions will add stress to the data cable punch-down connections and will eventually fail.



*Typical projector system in classroom*

**Audio/Video Systems:**

Typical classrooms have a wall mounted projector with VGA connection down to the teacher station computer. Each classroom has a smartboard with USB connection back to the teacher station computer. A coax TV distribution outlet is present in each classroom but is not utilized.

**Fire Alarm System:**

The fire alarm system consists of a Simplex 4001 panel located in the boiler room. The fire alarm panels appear to be from the 2001 renovation. No smoke detection was observed throughout the building. Notification is provided through system horn/strobes. Strobes are not provided in classrooms, toilet rooms, and other code required locations. Manual pull stations are higher than permitted by code. The system is in fair condition but does not meet current code requirements.

**Intercom/Public Address/Clock System:**

The public address system manufacturer is Dukane. The system is located in the main office. The system is in fair condition but it was noted that at least one classroom speaker is not working. The building clock system is also a Dukane system and is in poor condition. Many classroom clocks have been replaced with standard non-system battery power clocks. Typical classrooms contain a Cisco I.P. phone for communication and an office call pushbutton.

**Building Security System:**

There are four analog cameras located throughout the interior and exterior of the building tied back to a small recorder in the main office. The system is in fair condition but is limited in resolution and expandability.

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There is an intercom push button on the exterior of the main entrance doors with door release in the main office.

There are door access controls at the main door and a few exterior doors.

There is a building intrusion alarm system installed throughout the building with sensors at select locations. The intrusion system is in fair condition.

### **ELECTRICAL RECOMMENDATIONS:**

EES.ELEC.01 The original stage panelboard should be replaced with and branch conductors upgraded.

EES.ELEC.02 Occupancy sensors should be considered for all building lighting for added energy savings and to meet current energy code requirements.

EES.ELEC.03 Lighting switch heights should be reduced to meet ADA requirements.

EES.ELEC.04 The remainder of the exterior lighting not already upgraded should be upgraded with LED for energy savings and reduced maintenance costs.

EES.ELEC.05 The emergency generator should be replaced with a new larger exterior unit capable of adding walk-in coolers, freezers, and minimal building heat. Depending on the length of the frequent power outages, a larger unit capable of handling the entire building could be considered to minimize lengthy outages.

EES.ELEC.06 The data network system should be replaced or have deficiencies corrected.

EES.ELEC.07 The building fire alarm system should be replaced in its entirety to meet current codes.

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**Summary**



*Enders-Fisherville Elementary School*

Enders-Fisherville Elementary School is 58 years old many of its systems are at the end of their functional lifespan and it is in need of aesthetic and environmental upgrades. The educational spaces do not support the current or desired curriculum and do not reflect the latest standards of 21<sup>st</sup> century education. An extensive building renovation is needed to improve safety, energy efficiency, and educational performance.



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**History:**

Halifax Elementary School (HES) was originally built in 1968 with alterations and additions completed in 1988.

The building is located on a 7.3 acre steeply sloping site adjacent to the Halifax Area School District (HASD) Middle and High School complex within the Borough of Halifax on School Road. There is no corresponding mailing address associated with the building.

**Building Statistics:**

Size of Building:

Building 55,625 sq. ft. (1.5 story building)

Upper Level Floor Plan: 34,784 SF

Lower Level Floor Plan: 20,841 SF

Grades: The school currently educates students from 2<sup>nd</sup> through 5<sup>th</sup> grade. HES provides autistic and special education within the building and also relies on a consortium of school districts to provide these services to the community.

In October 2016, **315** students were enrolled at HES.

**Site:**

Vehicular Circulation & Parking:

The bus pick-up/drop-off area is located along the east side of the building with buses lining up "single file" in front of the building. It appears that there is not enough space for all of the buses to line up in this area (stacking back onto School Street) and that students/parents cross in-between the buses traveling to/from parked vehicles along the eastern edge of School Street. This is a significant safety concern.

Student drop-off occurs on the back (west) side of the building in an area that is not very well defined. Drivers make a counterclockwise loop through the "hard surface" play area at the rear of the school and traverse some very steep grades. It was also noted that parents line up for this pick-up area as much as 30-40 minutes in advance of dismissal causing



*Building exterior*



*Aerial view of site*



*Bus drop off area*

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*Hard surface play area and parent drop off*

concerns with stacked vehicles in the hard surface play area which may still be in use by students.

Visitor parking is located at the front of the school and is supplemented by unofficial on-street parking along the eastern edge of School Street and offsite parking at Halifax United Methodist Church for larger events. Staff parking is located at the rear of the building.

### Pedestrian Circulation

A limited number of students walk to school from the surrounding neighborhoods. School Street is relatively narrow and does not include any sidewalk in either direction (i.e. north towards Halifax Youth Center or east towards the Middle/High School portion of campus) nor is there any sidewalk connecting the front and back sides of the building (pedestrians either need to walk within/along the driveway on the north side or traverse a steep grass embankment on the south side). The only sidewalk in the area is immediately in front of the school at the bus pick-up/drop-off area.



*Deteriorated stairs at rear of building*

Sidewalks and Paving: The sidewalk along the front of the school is in good condition and provides a flush section to allow for handicap access directly across from the existing handicap accessible parking spaces. The concrete curbing along the described sidewalk appears to be in satisfactory condition, however this curb transitions to bituminous curb that is in poor condition and is in need of replacement. The “curb” on the opposite side of the access drive is simply a series of parking bumper blocks lined up end to end.



*'Alligatoring' and cracked pavement near staff parking (rear of building)*

Sidewalks along the rear of the building are only short “stub” pieces that provide access from the edges of paving to the building entrances located on this side. There is a set of concrete stairs between the various levels of paving that is crumbling and dangerous for any kind of use. Curb on the back side of the building is limited to small sections of bituminous curb that that are in poor condition.

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Storm Water collection area



Soft surface play area



Hard surface play area

Paving on the front side of the building is showing signs of deterioration with areas of alligator cracking near the main drop off area and at the south end of the access drive. Paving in the staff parking and parent drop off areas has various levels of deterioration. Near the entrance to the rear parking area, a portion of the paving has turned to a gravel and dust consistency. Other areas show large expanses of alligator cracking and crumbling pavement.

Storm Water Management: It appears there is some type of detention basin or collection area at the southwest portion of the site below the staff parking and play areas. No culverts or pipes of any kind were observed discharging into the basin (though there were a few storm sewer inlets along the bus drop off area on the east side of the building and near the staff parking areas). It did not appear that any kind of control device was in this basin area and a discharge pipe from the basin could not be located. Expansion of this basin may be possible to accommodate any new impervious surface constructed on this site but proximity of this facility to the property line, discharge location, and existing vegetation within the basin will need to be evaluated to confirm if this is a viable option.

Play Areas: A large “soft surface” play area with two sets of swings along with several other pieces of play equipment is located on the southwest side of the school. The equipment and overall state of the play areas appear to be in good condition (though we note that there is no fence surrounding this play area). There is also a large “hard surface” play area immediately south of the staff parking area on the west side of the building (which appears to double as overflow parking and as part of the parent pick-up/drop-off loop described above). This paved area appears to be in satisfactory condition but there are lighting standards located in the middle of the area that can present safety hazards for students. There is a 4’ high fence on three sides of this play area however some of the post bases have been undermined by erosion and some of the fence is leaning and in a state of disrepair. There are three ball fields located to the southwest of the school building which appear to be in good condition (we also understand they are utilized by local sports teams).

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Outdoor play area known as "The Pit"



Surface deterioration at roof transitions



Entrance canopy with wood decking

Additional Comments: The school is served with public water and sewer from the Halifax Area Water and Sewer Authority.

**Building Exterior:**

Façade: The exterior facades are primarily brick veneer with CMU backup. There are many areas where deterioration can be seen on exterior surfaces, primarily at the transitions from flat to sloped roof. Exterior concrete details show signs of deterioration at building egress and the loading dock.

The original exterior glazing system is still functioning but is at the end of its lifespan. Many of the aluminum window sills have rust from the original factory finished vertical steel mullions that drain to the sill.

Steel at main entrance canopy is rusting at the base and the exposed wood decking of the canopy is painted but showing signs of deterioration.

Exterior downspouts appear undersized to support the metal sloped roofing. Exterior lighting is outdated and does not appear to illuminate areas of egress beyond the immediate exit. Impact damage at loading dock can be seen including rusting. The exterior of the building is generally in fair condition.

Issues to consider:

- HES.EX.01 Drainage should be reviewed and repaired to prevent additional deterioration due to water infiltration.
- HES.EX.02 Replace exterior glazing system.
- HES.EX.03 Replace scuppers and downspouts.
- HES.EX.04 Repair or replace entry canopy.

Fenestration: Windows are in fair to poor condition and are at the end of their lifespan with broken seals and damaged frames. Most of the glazed openings have had replacement panels inserted where original ventilation grilles existed. There are signs of damage at exterior doors.

Issues to consider:

- HES.EX.05 Replace damaged exterior doors.
- HES.EX.06 Replace exterior glazing system.

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Loading dock

Roof: The roof is a mixture of flat and sloped areas and the building shows signs of exterior deterioration at the transitions. The metal roof was added in 2003. There are signs of water damage at ceilings throughout the upper level.

Issues to consider:

**HES.EX.07 Evaluate and repair roof as required.**

**Building Interior:**

Flooring: The building entrance has VCT flooring while corridors transition to the original (asbestos based) tiles that are showing edge deterioration and cracking. Many instructional rooms are fully carpeted and worn. Several areas were noted where base is pulling off of the wall and cracking. The library has newer carpet tiles.

Issues to consider:

**HES.BI.01 Repair damaged flooring and base.**



Downspouts and exterior glazing

Walls: The interior walls are primarily lined with painted CMU. Improvised student display systems were seen throughout and primarily involve twine strung from ceiling to ceiling as opposed to wall supported systems.

Issues to consider:

**HES.BI.02 Provide student display areas in corridors.**

Ceilings: Ceilings through most of the corridors and classrooms are acoustical ceiling tiles. Areas of damage were seen throughout. Corridor lighting is primarily lay in fluorescent and classrooms are primarily pendent fluorescent.

Issues to consider:

**HES.BI.03 Replace damaged ceiling tiles.**



Water damage at upper level ceiling

Food Service: Primarily original equipment is used in the kitchen; this is in need of replacement. A walk in refrigeration unit was located outside the facility adjacent to the loading dock. There is one serving line; capacity causes the line to stack outside of the room on the building's central staircase. The cafeteria uses wall mounted cafeteria tables that are integrated into the room's walls; this poses a fall threat to occupants. The

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Lower level ceiling and original flooring

room also serves as the gym and the auditorium causing scheduling issues. Additional cafeteria tables were stored in the mid-level corridor near the elevator.

Issues to consider:

HES.BI.04 Kitchen equipment should be updated.

HES.BI.05 Evaluate and replace built in tables.

HES.BI.06 Provide adequate storage to programmed space.

Code Compliance: Exterior access points begin on grade but are not all handicap accessible as some transition to steps at exits.



Classroom with carpet and pendent lighting

Door hardware into classrooms and storage areas is not ADA compliant.

Sinks within classrooms do not meet ADA requirements.

Water fountains are not handicap compliant.

Critical railings do not meet code and do not offer proper fall protection.

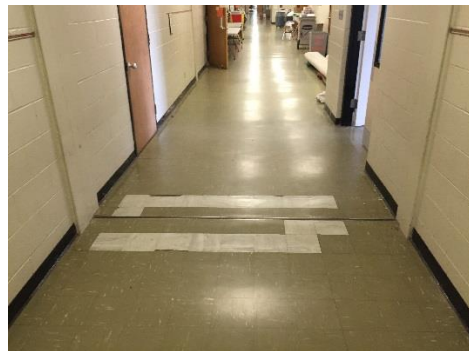
The building does not have a building-wide fire suppression system (sprinklers).

Issues to consider:

HES.BI.07 All plumbing fixtures in instructional spaces should be replaced with fixtures compliant with current ADA requirements.

HES.BI.08 Provide new railings at noted safety issues and other non-compliant conditions.

HES.BI.09 Any future renovation should include the installation of a building-wide fire suppression system.



Corridor floor repair and damaged tiles

Security: There is no secured vestibule and visibility from the front office is limited. The view from the administration office to the front door is obstructed by a solid wall.

The doors and door hardware into many classrooms are not sufficient for modern security standards. Teachers should have the ability to easily lock and unlock their classrooms from the inside.

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High fall risk at main stair

Two areas of high fall risk were noted during the walkthrough. The railing at the stair down to the multi-purpose room does not meet code and puts occupants at risk. An exit railing on the north face also creates a high fall hazard for occupants.

Issues to consider:

**HES.BI.10** A singular main entrance to the school should be made secure by routing visitors into administration offices prior to gaining entry to the main building.

**HES.BI.11** Doors and door hardware into classrooms should be replaced with more secure devices.



High fall risk at egress path/exterior storage

**Educational:**

Classrooms: Classrooms in the building are slightly oversized but overall the building lacks storage so future renovations would be able to incorporate storage and address classroom restroom issues without impacting the educational space. Several of the classrooms are not being used to capacity, several rooms are used only half of the day, and a few are used for other activities. Classrooms typically have projectors with smart boards that were repurposed from other school renovations. Classrooms generally lack proper distribution or capacity of electrical outlets to support activities. Casework in classrooms is in fair to poor condition. Most classrooms have good natural light except for the band, music, and health rooms which are in windowless areas of the lower level. In general, classrooms are in fair to poor condition.



Typical classroom

Issues to consider:

**HES.ED.01** Consider updating storage and restrooms within classrooms.

**HES.ED.02** Provide natural light to all classroom spaces.

Group Instruction: There are a few small group instruction areas in the school. A reading support SGI is currently located in a windowless storage room on the lower level. The school does not have a large group instruction space.



Reading SGI in windowless storage room

Issues to consider:

**HES.ED.03** Right sized small group instruction areas should be created.

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Windowless band and music rooms

HES.ED.04 Consideration should be given to creating a large group instruction space.

Special Education: The school currently has one special education room and one occupational therapy room which are held in full size classrooms. Although the rooms are oversized for the program, the restroom is undersized and does not support student or instructor needs.

Issues to consider:

HES.ED.05 Consideration should be given to creating rightsized classroom spaces for special education.

HES.ED.06 Consideration should be given creating restrooms that support the needs of special education students and instructors.



Art classroom

Music/Art: There is currently one room for art, one room for music, and one room for band. Art is currently taught in a typical classroom space with storage and sinks that are not accessible. Music and band are located in windowless rooms on the lower level. Circulation in the band room was noted to be difficult due to the room size and the number of chairs.

Issues to consider:

HES.ED.07 Create accessible storage and sinks in art room.

HES.ED.08 Consider creating classrooms with access to natural light.



Multi-purpose room

Science/Technology: There is no dedicated science classroom. The Computer lab is isolated from other subject rooms.

Issues to consider:

HES.ED.09 A dedicated space should be created for science education.

HES.ED.10 Consider a computer/media lab as part of the library and integrate computers into other subjects/classrooms.



Stage access and storage

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*Existing entrance is not secure*

Physical Education: The multi-purpose room acts as the school's gymnasium, cafeteria, and auditorium. There is limited storage adjacent the multi-purpose room. The stage appears to serve as overflow storage for physical education.

Issues to consider:

**HES.ED.11 Consider separate spaces for the gym and cafeteria**

Administration: The administration suite is not directly linked to a secure vestibule. The suite itself houses a toilet room that is not ADA compliant. The nurse suite does not have a separate room for exams.

Issues to consider:

**HES.ED.12 The main office should be extended to the front lobby to create a secured entrance area.**

**HES.ED.13 Consider creating a nurse office with an exam room.**

### Building – HVAC:

#### History:

The building was constructed in 1968 and underwent a major renovation in 1988. An additional HVAC renovation was performed in 2005 to control the presence of mold detected in 2002 and 2004. As a whole, the HVAC systems are in fair condition and the district should expect another 10 years of serviceable life from their components.

#### Central Plant:

The existing distribution system is a 2-pipe changeover system. This system allows heating and cooling HVAC water distribution through the same piping but not simultaneously. Constant volume zone pumps distribute the water through the building in insulated steel and copper piping. The zones are currently separated into the following groups: Pre-1987 classrooms, offices, multipurpose rooms, and Post-1987 classrooms. Vertical piping contained in concealed locations or drops within existing block walls may be original to the building. The ASHRAE Median Service Life for the pumps is 20 years.



*Existing mechanical room*

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The boiler room contains two Weil McLain oil fired cast iron hot water boilers with Power Flame burners. An underground fuel oil tank is located outside of the boiler room and a leak detection system is present. Each boiler's breeching has a draft control damper. The existing boilers appear to be in satisfactory condition. The ASHRAE Median Service Life for the boilers and burners are 35 and 21 years respectively.

**Central Cooling Plant:**

The school has a 70-ton Carrier Aquasnap air cooled chiller package in an Areaway located outside of the Boiler Room. The package is an all-in-one system containing pumps, expansion tanks, and all specialties. It is piped into the boiler room where it is introduced into the distribution system through ATC valves. The chiller sits on a concrete pad on grade. The ASHRAE Median Services Life for the chiller is 20 years.

**Unit Ventilators:**

A majority of classrooms and educational spaces are heated and ventilated with horizontal unit ventilators on the exterior walls. The unit ventilators receive outside air through a louver just above grade on the exterior wall. Each classroom has a relief air grille. Individual DDC space control is provided through a DDC Invensys system. The unit ventilators can dehumidify when the central plant is indexed to cooling. The ASHRAE Median Service Life for unit ventilators is 15 years. The units are nearing the end of their useful lives but appear to be in fair condition.

**Rooftop Packaged Air Handling Units:**

Packaged rooftop air handling units are present and serve multiple spaces within the facility. These units have electric heating coils and DX cooling coils. They are entirely disconnected from the central chilled and hot water plants. The reason for this separation is unclear; it is assumed that these units were added to supplement the ventilation and dehumidification capabilities of the school following the mold remediation in 2002 and 2004. The ASHRAE Median Service Life for the RTUs is 15 years. The units appear to be in good condition.

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**Kitchen Exhaust:**



*Existing kitchen*

The kitchen has a single-sided exhaust hood backed up against a common partition wall. Make-up air is transferred in from the adjacent multi-purpose room. Each kitchen hood is exhausted by an upblast fan on the roof. An ANSUL fire suppression system is present for portions of the hood as required by code. The dishwasher is exhausted through two direct connections and discharges through a rooftop upblast exhaust fan. The ASHRAE Median Service Life for the exhaust fans is 15 years

**Terminal Heating Equipment:**

Terminal heating equipment such as radiation, cabinet unit heaters, convectors, and unit heaters are present to heat auxiliary spaces such as toilet rooms, vestibules, mechanical rooms, and storage rooms. These units all have hot water coils and individual thermostats. A majority of the units were replaced during the renovations but several pieces are existing to the building and are candidates for replacement. The ASHRAE Median Service Life for the heaters range from 20-25 years.

**Exhaust Air Systems:**



*Existing art rooms*

In addition to the kitchen (described above), toilet spaces, select storage spaces, mechanical room, and janitor's closets are exhausted through ductwork to rooftop exhaust fans. The art classroom does not have exhaust provisions which is required for International Mechanical Code compliance. A majority of the fans were replaced during the renovations but several pieces are existing to the building and are candidates for replacement. The ASHRAE Median Service Life for exhaust fans is 20 years.

**Ductwork Systems:**

The supply, return, and exhaust air ductwork is galvanized steel sheet metal except for the dishwasher exhaust which appears to be sealed aluminum. The ductwork transition for the unit above the stage is extremely noisy and should be reconfigured to reduce breakout sound. Fiberglass duct insulation is provided

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for all supply and return ductwork associated with the rooftop. Flexible duct was utilized for final connections to supply diffusers. The ASHRAE Median Service Life for ductwork is 30 years.

### **Automatic Temperature Controls:**

The ATC system is a direct digital automatic temperature control system with electric damper and valve actuation. The ATC system is based upon an Invensys system.

### **Miscellaneous:**

In several instances the corridors are used as return or relief air plenums. This is not permissible by the International Mechanical Code.

### **HVAC RECOMMENDATIONS:**

HES.HVAC.01 As a whole, the HVAC systems are in fair condition and the district should expect another 10 years of serviceable life from its components.

HES.HVAC.02 The base-mounted zone pumps have been repaired several times and the motors have been replaced. These units have exceeded their expected lives and should be replaced.

HES.HVAC.03 Exhaust fans and terminal heating devices that are original to the building have well exceeded their expected lives and should be replaced.

HES.HVAC.04 The corridor return/relief plenum system must be revised to comply with the requirements of the International Mechanical Code. Use of a corridor as a plenum is not permitted.

HES.HVAC.05 Exhaust should be provided for the art classroom to provide the ventilation rates required by the International Mechanical Code.

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**Building – Plumbing:**

**History:**

The building was constructed in 1968 and underwent a major renovation in 1988. With exceptions, a majority of the plumbing fixtures and equipment are original and are nearing, or have exceeded, the end of their useful lives.

**Plumbing Utilities/Services**

**Domestic Water Service:** The building's domestic water supply is served from a city/municipal water system. The 3" domestic water service entrance in the boiler room includes a water meter and a 3" double check backflow preventer. The existing domestic water supply appears to be adequate to serve the existing building and in good condition with all components installed in a serviceable location. However, there was a noticeable fluctuation in the water pressure at a pressure gauge located at the existing water service entrance.

**Septic/Sewage:** The building drainage system is served by a city/municipal public sanitary sewer system. The school district has reported that there are no known issues with the existing below slab sanitary sewer system.

**Natural Gas:** Natural gas service is not available at this site. Oil is used as the primary heating fuel.

**Plumbing Equipment**

**Domestic Water Heating:** The existing domestic water heating system includes a single oil-fired water heater located in the boiler room. The water heater replaced the original hot water generator and appears to be in fair condition considering its possible age. There did appear to be some corrosion around the bottom of the tank. It appeared that the hot water is delivered to the building at one temperature as a master thermostatic mixing valve was not observed. There was a booster heater installed originally for the kitchen. The existing recirculation pump appears to be in good condition, however it

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is installed high within the piping and is not very accessible to inspect and maintain.

**Plumbing Fixtures:** Most of the plumbing fixtures appear to be original with some replacements during the renovations and in most cases are in poor condition. The water closets and urinals are blow-out type fixtures that flush with a high volume of water. There are no ADA/Accessible fixtures based on the current regulations. Most faucets are not provided with low flow as required by the current plumbing code. Also, tempering valves required by current IPC plumbing codes at public handwashing lavatories have not been installed.

#### Plumbing Drainage Systems

**Sanitary Drainage:** The below slab sanitary drainage piping serving the building was primarily installed during the original 1968 construction with some modifications. The age of the below slab piping is approximately 48 years and could experience condition issues. The school district has reported no issues or problems associated with the building's sanitary drainage system. Cleanouts to facilitate drainage piping maintenance were observed. A grease trap was installed within the kitchen area and connects to drainage piping serving select kitchen equipment. The grease trap is steel construction and appears to have been installed during the original construction of the building in 1968 but that has not been verified. The school district reported no known condition issues with the existing grease trap and it is unknown if the grease trap is emptied and properly maintained on a regular basis. There were no plaster traps observed at the art room sinks.

There is a sump pump located in the boiler room. It is unknown if the pump discharges to storm or sanitary drainage. The age and condition of the pump is also unknown but there have been no reported failures by the school district.

**Roof Drainage:** The roof drainage system is composed primarily of gutter and downspouts but there are flat roof areas with roof drains and interior rainwater conductors. The school district has reported some issues with the roof leaking but not specifically at the roof drains. It is unknown if the district had a scan done of this roof like they did at Enders/Fisherville

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Elementary School. Cleanouts to facilitate storm drainage piping maintenance were observed. Existing roof does not appear to have parapets so no emergency roof drains were provided and it would appear that an emergency roof drain system would not be required if the building was renovated.

**Plumbing Water Supply System:** The domestic water supply piping serving the building is primarily copper and for the most part appears to be original to the building. Corrosion of the piping was observed with some of the gang toilet and boiler room piping. The school district has not reported any major failures or condition issues with the existing water distribution piping system. Existing piping system and fixture trim was installed prior to enactment of the 2011 “Reduction of Lead in Drinking Water Act” which has set stricter standards for lead content in materials used within potable water piping systems.

**Fire Protection:** An Automatic Fire Suppression Sprinkler System has not been installed within the existing building.

### PLUMBING RECOMMENDATIONS:

HES.PLUM.01 The main water service backflow preventer should be tested annually and tagged.

HES.PLUM.02 The existing domestic water heater appears to have exceeded its life expectancy and should be replaced. During any major renovation of the domestic hot water heating system, a thermostatic mixing valve, compliant with current ASSE requirements, should be provided and installed in a location facilitating easy inspection and maintenance to create a two-temperature system. An additional hot water recirculation pump would also be required. The existing hot water recirculation pump should be relocated to a more accessible location for inspection and maintenance. If there is a two-temperature system, it was not observed and was not easily accessible. If it exists, it should be relocated to a more accessible location and the mixing valve should be replaced.

HES.PLUM.03 Overall most plumbing fixtures are in poor condition and should be replaced with new low flow fixtures and low lead compliant faucets. Renovations to the toilet rooms should address any ADA/Accessibility issues as well as current

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water conservation requirements and the “Reduction of Lead in Drinking Water Act”. Consideration should be given to updating remaining fixtures to ANSI A117.1/ADA compliant accessible fixtures as part of any future renovation. Consideration should also be given to providing ASSE certified tempering valves at handwashing fixtures for scald protection as required by current plumbing codes.

HES.PLUM.04 Condition of the existing grease trap should be monitored and replaced with HDPE corrosion resistant grease trap if necessary. During any major kitchen renovation, consideration should be given to replacing interior grease trap, if possible, with an exterior grease interceptor to provide easier and more sanitary maintenance and cleanout.

HES.PLUM.05 Plaster traps should be added on drainage piping from sinks in casework at existing art room sinks.

HES.PLUM.06 Condition of existing below slab sanitary drainage piping should be verified via video scoping of existing lines and replaced as part of any future renovation as determined necessary by the scoping.

HES.PLUM.07 Requirements for emergency rainwater drainage system should be verified based on structural loading capacity if water is ponding on roof. Provisions for emergency rainwater drainage system should be added if required by roof construction and the inability of the roof to handle the amount of water that would pond on the roof before it could spill over any parapet walls or edges of the roof. Parapet walls were not observed.

HES.PLUM.08 Potable water system should be tested for lead. Lead reduction filters should be installed at all drinking fountains and potable water outlets intended for human consumption as required based on test results.

HES.PLUM.09 Review condition of any existing emergency/safety plumbing fixtures and correct deficiencies as required. Verify that all emergency/safety fixtures are routinely tested as required by ANSI Z358.1 and OSHA.

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HES.PLUM.010 Provide emergency/safety plumbing fixtures in any area where caustic, corrosive or injurious chemicals are used or dispensed in accordance with OSHA regulations and ANSI Z358.1. Review MSDS information to determine required emergency fixtures. Possible locations could include boiler room with chemical treatment equipment and janitor/custodial closets.

HES.PLUM.11 Consider addition of an automatic fire suppression sprinkler system or alternative fire resistant building construction during any future renovations or building additions.

**Building – Electrical:**

**Summary:** The building was constructed in 1968 and underwent renovations and additions in 1988. Most of the electrical systems are original and in fair to poor condition.

**Electrical Distribution:**

The electrical service is located in the lower level mechanical/electrical room. The service originates from a PPL Energy Utility pad mounted 750KVA transformer exterior to the building. The building power distribution originates from a 480/277V Westinghouse switchboard with 1,200amp main breaker and distribution sections. 120/208V distribution is provided by a 1,200A distribution panel fed from the main switchboard via a 300KVA dry-type transformer. The switchboards are in fair condition and were replaced during the 1988 renovations.

Branch panels throughout the building consist of Westinghouse panels replaced in the 1988 renovation and original Federal Pacific panelboards. The Westinghouse panels are in fair condition but nearing their life expectancy of 30 years. The original Federal Pacific panels are beyond their useable life and should be replaced. The electrical equipment does not have National Electrical Code (NEC) required Arc Flash warning labels.

In general receptacle placement is sufficient for the building. It was noted that ground fault protection is not provided for



*Existing building plaque at entrance*

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receptacles throughout the building within 6' of sink basins or for 15 and 20amp 120v outlets in the kitchen as required by the current NEC.

**Lighting System:**

Original classroom lighting consists of fluorescent pendants. Measured lighting levels in the original classroom range from 22 to 24 foot-candles which is low for the classroom environment. The classrooms contain two line-voltage switches controlling two rows of lighting each but do not utilize occupancy sensors for automatic shutoff.

Classrooms in the 1988 building addition consist of recessed 2X4 troffers with 3-lamp, T8, energy saving, 28W, fluorescent lamps and Holophane 8224 glare reducing lenses. Measured lighting levels in the typical classroom in the building addition range from 40 to 55 foot-candles which is acceptable for the classroom environment. The classrooms contain two line-voltage switches controlling half of the fixtures each but do not utilize occupancy sensors for automatic shutoff.

The corridor lighting utilizes 2X2 opal drop lens troffers with 4-lamp, T8, 17watt fluorescent lamps and are controlled by line-voltage switches with no automatic shutdown control.

The gymnasium/cafetorium utilizes 4X4, 6-lamp, fluorescent lighting fixtures and are controlled by line-voltage switches with no automatic shutdown control.

Building mounted lighting switches were measured at 50" above finished floor which do not meet the American with Disabilities Act (ADA) requirement of 48" maximum height.

Separate emergency only fixtures are provided throughout the building to meet emergency lighting requirements.

Multiple exit signs were noted as not working properly.

Building exterior lighting consists of HID cobra head fixtures with individual photo sensors for parking areas and High Pressure sodium fixtures for canopy and building mounted lighting. The layout appears to be sufficient for the parking and

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perimeter lighting around the building. Some of the building mounted fixtures were illuminated during the site visit indicating some of the photo sensors are either failing or need adjustment. The parking and building mounted fixtures are in fair condition and are maintainable.

**Emergency Generator System:**

The emergency generator is located inside the building lower level mechanical/electrical room. This generator is a Kohler 50KW, 120/208V diesel unit fed from an exterior 275 gallon oil tank. The emergency distribution has one automatic transfer switch (ATS) in the electrical room and feeds both life-safety standby loads from the single transfer switch. Current code requires two transfer switches for separate distribution of life-safety and standby loads. The generator system is in poor condition and appears to be leaking oil.

**Data/Network System:**

The Main Distribution Frame (MDF) for the building is located in a storage room central to the building between the office and cafeteria. The data rack is a full height two post rack without wire management. The building wiring solution is Cat 5E. The storage room is of sufficient size for the rack however wire management should be added for the many cables on the rack.

One additional patch panel and network switch was observed in the computer lab. The patch panel is mounted to the back of a movable desk and the switch is located on a shelf under the desk. A permanent, lockable, network rack should be provided for the switch and patch panel.

The typical classroom has what appears to be an abandoned token-ring network drops with a patch cord between the two wall-mounted drops. The current building solution utilizes Cat. 5E, Ethernet with WiFi access device on the ceiling and two data drops in one corner. Patch cords were observed in many locations to extend data from the corner drop to another location in the room. It was also noted that many of the data drop were installed in surface mounted boxes missing covers allowing for additional stress on the data cable punch-down connections.

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Existing classroom technology

**Audio/Video Systems:**

The typical classrooms have a wall mounted projector with VGA connection down to the teacher station computer. Each classroom has a smartboard with USB connection back to the teacher station computer. A coax TV distribution outlet is present in each classroom but is not utilized.

**Fire Alarm System:**

The fire alarm system consists of a Simplex 2001 panel located in the main office. No smoke detection was observed throughout the building. Notification is provided through system bells. Notification strobes were not observed throughout the building as required to meet ADA requirements. Manual pull stations in the addition meet code required heights however, pull station locations in the original building are all higher than heights required by code. The system appears to be from the 1988 renovations and is in fair condition but does not meet current code requirements.

**Intercom/Public Address/Clock System:**

The public address system manufacturer is Rauland Telecenter. The system is located in the main office and is in fair condition. The building clock system consists of Simplex 2400 hard-wired system which provides wired correction to analog clocks throughout the building. The clock system is in poor condition. Some classroom clocks have been removed and it was noted that the clocks and bells do not sync with the new high school system. The typical classroom contains a Cisco I.P. phone for communication.

**Building Security System:**

There are multiple analog cameras located throughout the interior and around the exterior of the building tied back to an Ademco Video recorder in the main office. The system is in good condition but is limited in resolution and expandability.

There is an intercom push button on the exterior of the main entrance doors with door release in the main office.

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There are door access controls at the main door and two back stairwell doors.

There is a Sonitrol building intrusion alarm system installed throughout the building with infrared sensors at select locations throughout the building. The intrusion system is in fair condition but is having interfacing issues between the old system and new components recently installed.

**ELECTRICAL RECOMMENDATIONS:**

HES.ELEC.01 Electrical power distribution should be updated. All original branch panels are beyond their useable life and the Westinghouse panels from the 1988 renovations are approaching the end of their life. Neither Federal Pacific or Westinghouse are still in business to produce replacement parts for the equipment. As part of replacing the original panelboards, the original branch circuiting should also be replaced.

HES.ELEC.02 GFI protection should be provided for all receptacles within 6' from sink basins and all 15 and 20 amp receptacles in the kitchen and serving areas to meet current code requirements.

HES.ELEC.03 Occupancy sensors should be considered for all building lighting for added energy savings and to meet current energy code requirements.

HES.ELEC.04 Lighting switch heights should be reduced to meet ADA requirements.

HES.ELEC.05 Replace all exit signs with new LED type signs.

HES.ELEC.06 Classroom lighting levels are deficient in the original classroom locations and should be updated to meet recommended lighting levels and current energy codes. Current energy code limitations on lighting power density for classrooms is 1.2watts/square-foot.

HES.ELEC.07 Exterior lighting could be replaced with LED for energy savings and reduced maintenance costs.

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HES.ELEC.08 The emergency generator should be replaced with a new exterior unit and will require updated distribution to meet current codes.

HES.ELEC.09 The data network system should be replaced or have deficiencies corrected.

HES.ELEC.10 The building fire alarm system should be replaced in its entirety to meet current codes.

HES.ELEC.11 Replace the clock system with a new system which syncs with the new high school system.

HES.ELEC.12 Upgrade the existing security intrusion system to eliminate interfacing issues.

### Summary



*Halifax Elementary School*

Halifax Elementary School is 48 years old and many of its systems are at the end of their functional lifespan and it is in need of aesthetic and environmental upgrades. The educational spaces do not serve the current or desired curriculum and do not reflect the latest standards of 21<sup>st</sup> century education. An extensive building renovation is needed to improve safety, energy efficiency, and educational performance. In addition, the capacity of the school would not accommodate the full Halifax Area School District K-5 enrollment which causes inefficient redundancies to occur between this facility and Enders-Fisherville Elementary School.

