

DRAFT

Patrick Henry Elementary School

4643 Taney Ave, Alexandria, VA 22304

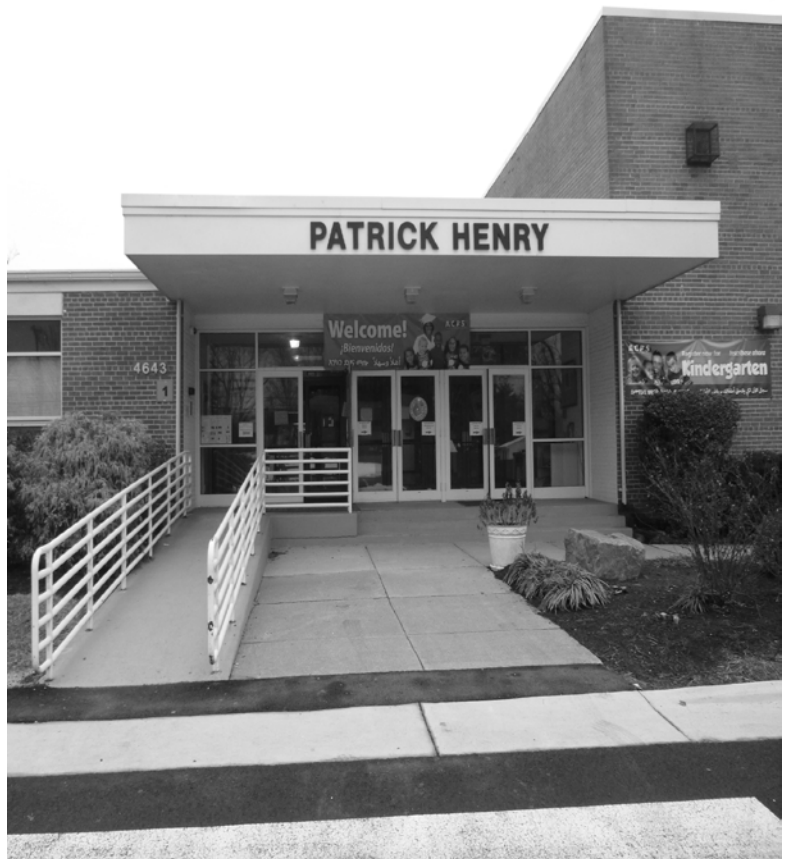
Existing Facilities Assessment

Alexandria City Public Schools

Planning, Design & Construction Office

1340 Braddock Place

Alexandria, VA 22314



14 February 2019

Cole&DennyArchitects

14 February, 2019

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1 APPROACH

Cole & Denny Architects (CDA) was appointed by Alexandria City Public Schools (ACPS) to conduct an assessment of the existing facilities at Patrick Henry Elementary School, located at 4643 Taney Avenue in Alexandria, Virginia. CDA's review included site visits on January 19 and 28 to assess the conditions of the interior of the building, the exterior envelope, the roofing system, and the accessibility of the building for people with disabilities. Additionally, Potomac Energy Group (PEG) conducted surveys to assess the mechanical, electrical, and plumbing (MEP) systems.

CDA noted the close adjacency of the new building and existing building with respect to the fire-resistance rating requirements for exterior walls based on fire separation distance.

Midway through the facility assessment, the City of Alexandria, Department of Planning and Zoning issued a checklist of items to be analyzed by a professional architect and engineer prior to occupancy. The checklist is addressed by this report.

2 EXECUTIVE SUMMARY

Under the assumption that Patrick Henry Elementary School may be occupied for the next four years, 2019 through 2023, the following is a summary of the assessments findings and recommended actions:

1. There are 45 classrooms with a maximum occupancy of 1,731 persons per the building code.
2. Replace the fire alarm system to meet current code.
3. Provide fire resistance rated construction and opening protectives at building separation distances less than 30, 20, 15, and 10 feet.
4. Confirmation from the Department of Code Administration that a sprinkler system is not required.
5. Replace stained and damaged acoustic ceiling panels. Continue replacement as new stains occur.
6. Patch and maintain the roofing system.
7. Provide supplemental tankless water heaters at each toilet room and kitchen.

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8. A mechanical contractor shall service all RTUs and provide service tickets with recommended repairs for each unit.
9. Re-lamp all lights. Clean or replace light lenses.
10. Provide additional on-site parking and stripe accessible parking spaces.
11. Provide a parent (car) drop-off separate from the bus drop-offs.
12. Provide site improvements including grass spaces, sidewalks, fences, and storm water management.

In general, the facility is in working condition, but needs repairs in a number of areas and more significant attention in the case of the fire alarm system and possibly the sprinkler system.

3 CODE SUMMARY

The repairs described above should be completed under the 2015 Virginia Existing Building Code. These repairs must receive building permits from the City of Alexandria's Department of Code Administration.

The existing building's code summary per the 2015 Virginia Construction Code is as follows:

Original Year Built: 1953

Original Building Code: Virginia Fire Safety Regulations 1949

Use Group: E Educational

Construction Type: IIB

Existing Building Area: Approx. 86,437 SF

Existing Building Height: 1 Story, 26'-6 5/8"

Fire Alarm: Yes

Sprinkler: No

The 2015 Building Code requires new educational use buildings to be sprinklered. However, repairs to the existing facility under the 2015 Virginia Existing Building Code would not require a sprinkler system be added to the existing building. This interpretation should be confirmed with the Department of Code Administration.

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The original school building was built in 1953 with a recreation center added in 1972, a media center added in 1995, and the modular classrooms added in 2010. The sum of this construction is 86,437 SF, which exceeds the 2015 code for allowable area of a Type IIB Educational building without a sprinkler system.

For the maximum allowable school and recreation center occupancy load- see the attached Occupancy Diagram, SK-02.

4 INTERIOR FINDINGS

Visible water damage was apparent throughout the school, with the exception of the gym located at the north end of the building. In the majority of rooms, water stains were apparent on the acoustic ceiling panels as well as on some light lenses located in the drop ceiling. Acoustic ceiling tiles located directly below the roof structure and above some of the drop ceilings also had water staining or water damage. Where the underside of the roof construction was visible, water stains and nail/screw holes are evident. Acoustic ceiling panels were bowed from humidity and some contained holes or breakage due to water damage. Many of the built-in wood bookshelves located under windows show signs of water damage or warping.

The Music room had an active leak along the windows during the January 19th survey. Classrooms 3, 5, and 7 on Associates Avenue corridor showed evidence of water damage around the exterior doors and nearby plaster walls. Floor tiles around the water fountain in the Gym Lobby were warped/water damaged. Floor tiles in bathroom of Classroom 9 on Bachelor's Lane corridor had water damage around the toilet. Classrooms 36, 38, 42, 43, and 45 off of Master's Way corridor showed signs of water damage under the windows. The Boys' Toilet Room off of Doctorate Drive corridor has plaster deterioration around the window and rust on the ceiling grid.

Other signs of deterioration include: Rusted and/or dirty air vents located in the dropped ceilings in the Auditorium, Kitchen, Cafeteria, and Meeting Room. Floor tiles in the Vestibule in front of the Game Room are delaminating. A rusted radiator was observed in the Mens' Restroom near the Gym. Many lights throughout the building did not illuminate

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when switched on; in classrooms closer to the windows this may have been due to a daylight sensor, but this was not confirmed. Many of the flat acrylic light lenses were warped, damaged, or missing. A section of missing floor tile was observed in Office 2 off of Scholars Crossing corridor. Both floor and walls were scuffed throughout the Cafeteria.

5 EXTERIOR FIRE RESISTANCE RATINGS

The new school building is close to the Gym of the existing Recreation Center. At the nearest point the two building are approximately 8.5 feet away from each other. The Building Code requires the exterior walls of both buildings to have a 1-hour fire resistant rated when the separation distance is less than 30 feet.

The roof of the existing gym is at a lower elevation than the new school and, as a result, the portion of the roof that is within 30 feet of the new school is required to have a 1-hour fire resistance rating.

The close proximity also requires openings of both buildings to be fire resistant rated, including the existing gym door no. 14 and new school door no. 37. The windows on the first, second, and third floors that surround doors no. 36 and no. 37 of the new school shall not comprise more than 75% of the wall within 20 feet building separation distance, 45% of the wall within 15 feet separation distance, and 25% of the wall within 10 feet building separation distance. Any window area that exceeds these percentages will require a 1 hour fire resistant rated opening protective.

See sketch, Concept Plan, SK-01.

6 ROOFING SYSTEM

The majority of the roofing consists of an adhered TPO roofing system which was installed in 1999 and has reached warranty period. The modular classrooms have an adhered EPDM roofing system and the Recreation Center has ballasted EPDM roofing system. There is a small section of standing seam metal roofing and a skylight. The total roof area is approximately 86,437 square feet.

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In general, the seams of the TPO membrane appear to be in acceptable condition; however hairline cracks are beginning to appear immediately adjacent to seams. In some instances, caulk/sealant has been applied over the seams. Standing water, ice and debris were observed in the valleys which appear to be centrally located over corridors.

7 BUILDING ACCESSIBILITY

The lower landing of the ramp at the main entrance extends into the bus drop-off lane and the stairs to the right of the ramp have no handrails. The Lobby Vestibule does not have enough clearance for two doors in a series.

Ceiling height at top of ramp in Scholars' Crossing hallway is 6'-11 ¼", and ceiling height at ramp in University Boulevard is 6'-8 ¼".

Girls' Toilet Room in the kitchen custodial area has a 2'-0" wide door and 3'-8" room width.

The Cafeteria has no egress door directly to the exterior, both egress doors exit to University Boulevard hallway. Typical toilet rooms in Classrooms 9-12 and 17-20 have 2'-0" wide doors, interior room dimensions of 2'-11"W x 5'-3"L, and 15" toilet height.

Typical counters in Classrooms 9-12 and 17-20 are 25 ½" high. The Teacher's Lounge restroom is 3'-7 ½"W x 7'-0"L with non-compliant door, sink, and toilet clearances.

The right handrail of the exterior stair at the end of Bachelor's Lane is damaged and detached from the building.

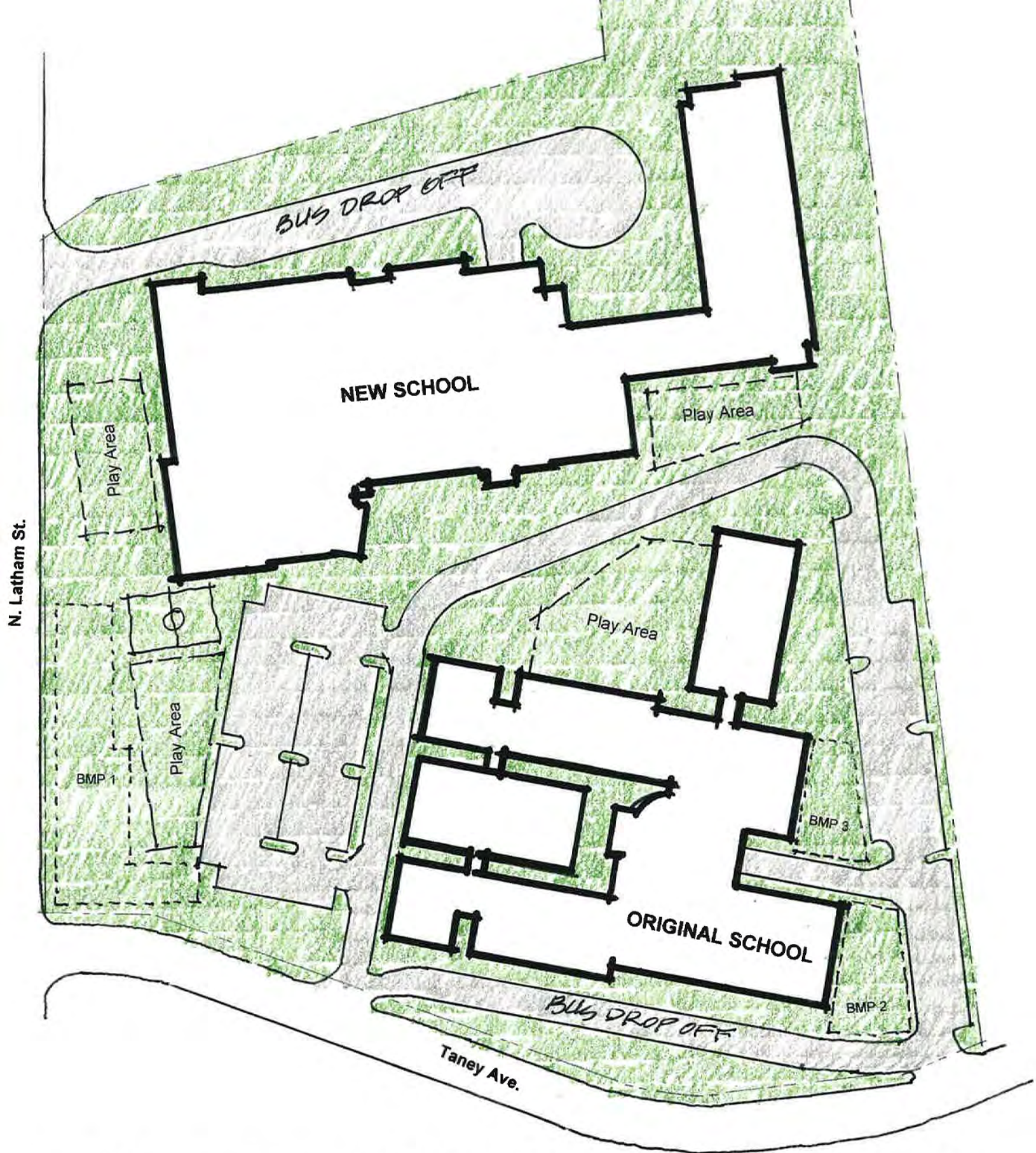
Various doors throughout the building have knobs instead of lever handles. Many doors that are used for building egress were observed to be less than the 32" wide. Many egress doors exiting the building either have a step or multiple stairs just before, at the frame of, or just after the exit doors.

See sketch, Concept Plan, SK-01 for the proposed location of accessible parking spaces.

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8 MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE ALARM SYSTEMS

See the accompanying Mechanical, Electrical, Plumbing, and Fire Alarm report prepared by Potomac Energy Group.



Cole&DennyArchitects

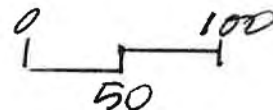
333 North Fairfax Street
Alexandria, VA 22314

703.684.5994
coleanddenny.com

Patrick Henry – Interim Concept

[dependent on DSUP amendment]

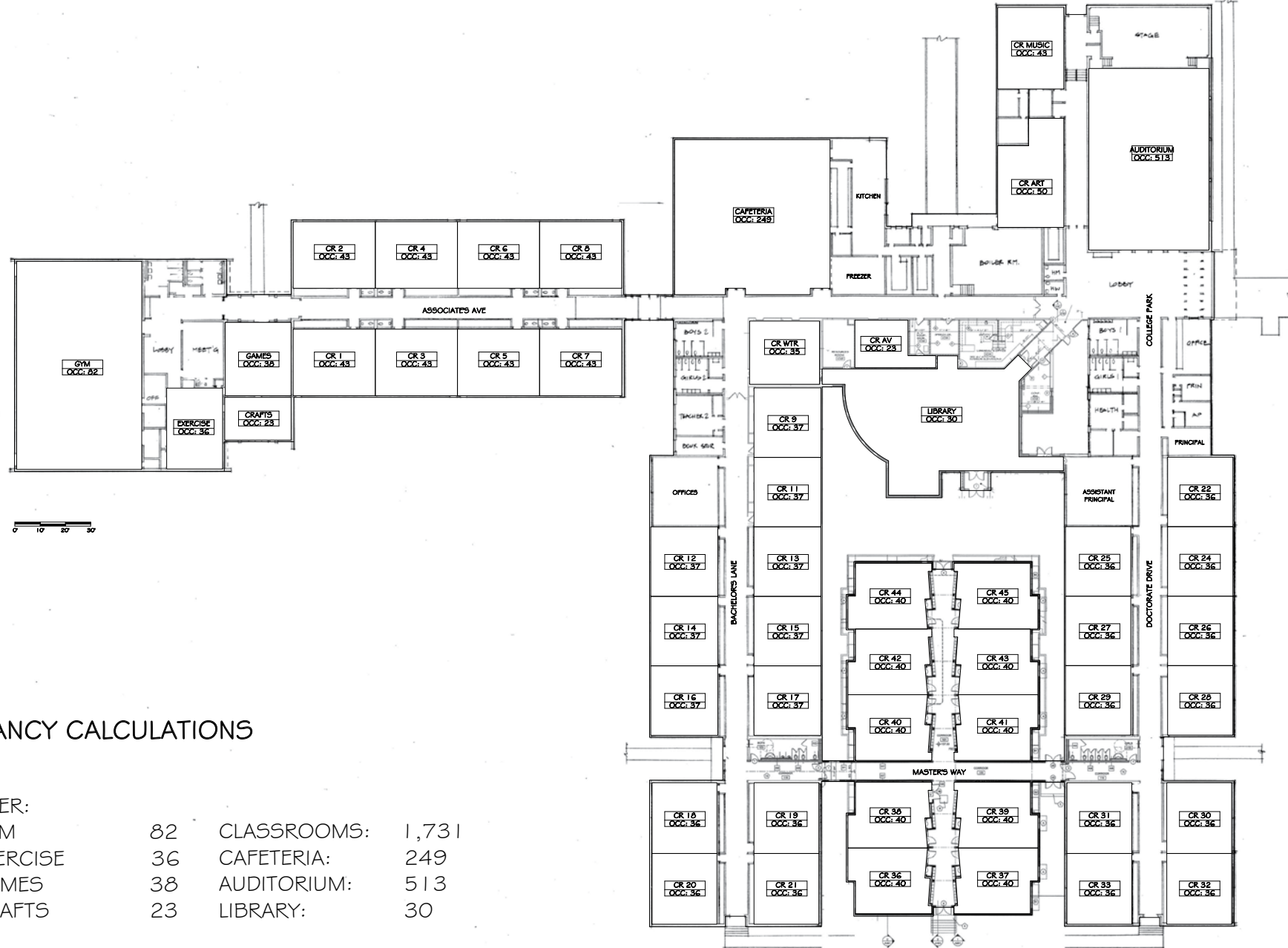
Patrick Henry Elementary School Facilities Assessment



SK-01A

13002.12

DATE: 02/14/19



OCCUPANCY CALCULATIONS

| | | | |
|-------------|----|-------------|-------|
| REC CENTER: | | | |
| GYM | 82 | CLASSROOMS: | 1,731 |
| EXERCISE | 36 | CAFETERIA: | 249 |
| GAMES | 38 | AUDITORIUM: | 513 |
| CRAFTS | 23 | LIBRARY: | 30 |

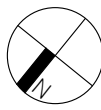
Cole&DennyArchitects

333 North Fairfax Street
Alexandria, VA 22314

703.684.5994
coleanddenny.com

Occupancy Diagram

Patrick Henry Elementary School Facilities Assessment



SK-02

13002.12

DATE: 02/14/19

MEP Systems Evaluation



Patrick Henry Elementary School

4643 Taney Ave, Alexandria, VA 22304

Prepared for:

Cole and Denny Architects

333 N Fairfax

Suite 300

Alexandria, VA 22314

Prepared by:

Potomac Energy Group, Inc.

2901 Telestar Court

Suite 400

Falls Church, VA 22042

February 13, 2019



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GLOSSARY

AHU – Air Handling Unit

CFM – Cubic Feet per Minute

FCU – Fan Coil Unit

FP – Fire Protection

GEN – Generator

HVAC – Heating, Ventilation and Air Conditioning

KW – Kilowatt

MBH – Thousand BTU an Hour

MEP – Mechanical, Electrical, and Plumbing

OA – Outside Air

RTU – Roof Top Unit

RUL – Remaining Useful Life

VAV – Variable Air Volume

VFD – Variable Frequency Drive

VRF – Variable Refrigerant Flow

Part 1 – Introduction

This evaluation report addresses the existing condition of the MEP systems at the Patrick Henry Elementary School located at 4643 Taney Ave, Alexandria, VA 22304. The evaluation was commissioned by Cole & Denny Architects in context of reusing the existing building for a temporary educational occupancy of three years.

The information presented in this report has been compiled through field investigations conducted in January 2019 and review of limited existing construction documents by Potomac Energy Group (PEG) representatives.

Part 2 – Purpose and Scope

The purpose of this evaluation report is to assist Cole & Denny Architects and ACPS in understanding the existing conditions and capacity of the building's systems. Per the client's request and directive, the evaluation encompassed the entire MEP and FP systems currently in use.

PEG's investigation team's inspections and field surveys were limited to readily observable and accessible systems components without destructive cutting into finishes or testing of equipment operation.

The scope of observation and review of the original design documents was to gain a general disposition of the building relative to the following criteria:

- Age of the systems and life expectancy of their components.
- Damage and disrepair of any system.
- Code non-compliance.
- Functionality issues
- Capacity of the systems

Part 3 – Building History

The original building was built in 1953 for the use of an elementary school. Since then, the building has undergone multiple renovations and additions. The latest addition was 10 modular classrooms installed in 2011. The MEP system for most of the building was upgraded in 2002.

Part 4 – Existing Condition of the MEP and FP Systems

HVAC Systems:

Overall the building HVAC system is in fair condition. The entire school is served by forced air systems. The building is served by package rooftop units (RTUs). The facility does not have any boilers or a cooling tower. There are 21 rooftop units (RTUs) in total and 10 split system heat pumps serving the building. A couple of AC units cool the server room. All RTUs are 17+ years old and are in fair to poor condition. About 16 of the RTUs are equipped with a heat recovery devices. The average life of an RTU according to ARSHAE is 15 years; all of the units have surpassed their expected lifespan. The heat pumps serving the modular building were installed in 2011 and are in good condition. The concealed ductwork within the building is in good condition, but the exposed ductwork on the roof is in poor condition. In some cases insulation was observed peeling off the rooftop ducts. Duct smoke detectors are located in the return air duct sections.

Plumbing System:

The building has a 3” cold water service and a single water heater coupled with a supplemental storage tank. Some of the water distribution piping is routed in the old steam tunnels under the building. It appears that most of the hot water and cold water pipes are insulated. All lavatories are equipped with approved tempering valves. Plumbing fixtures are in fair to poor condition. Most of the roof drain domes are missing and blocked roof drains are causing pools to form on the roof. Gas supply piping on the roof is missing multiple supports.

Electrical System:

The building has a 2500 Amp service. Half of the panel boards and most of the power distribution system are in good condition. The lighting fixtures are inefficient and are in poor condition with the exception of a few areas. Classrooms have adequate power outlets with most of the wiring being surface mounted. Lighting control is done by manual switches, with each classroom having 2 switches per room.

Life Safety System:

The fire alarm system is outdated and does not meet the current code requirements. Classrooms are not equipped with audio and visual devices and the audio and visual devices in the corridors do not meet the current code requirements.

Fire Protection:

The building does not have fire service. With the exception of a few storage rooms the building does not have a sprinkler system.

Part 5 – Observations and Analysis

The heating, cooling, and ventilation systems seem to be operational. Although not every unit was tested, the majority the systems were observed to be in order. The amount of fresh air delivered to the space could not be verified. During the evaluation, a few of the outside air dampers' operation were tested. The tests indicated that the dampers were responding to occupied and unoccupied schedules but the quantity of air flow were not verified.

Significant number of ceiling tiles in various spaces had water marks and damages during our site evaluations. The intensity and quality of these marks and damages were much greater near the windows in almost all classrooms. Refer to the attached photos.

Our visits to the building occurred during very dry weather conditions and we were not able to observe any active condensation. However, we believe the tile stains and damages are caused by condensation.

The building as a whole is in fair condition but over the next 3 years; the systems in fair condition will continue to decline.

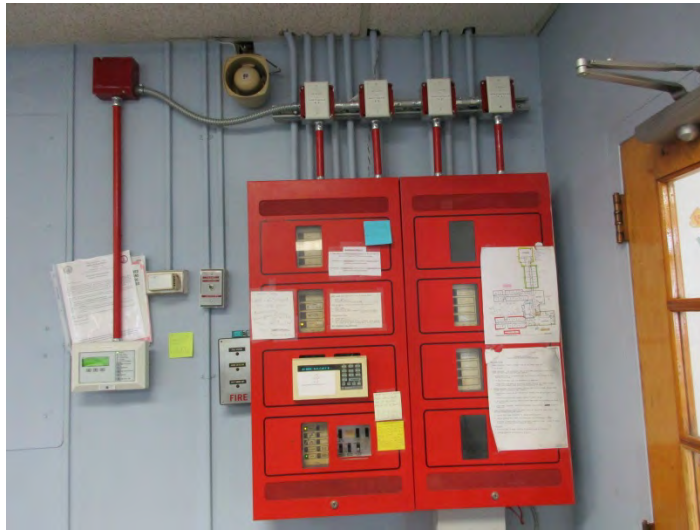
Having such a large number of students raises concerns of life safety, especially with an outdated fire alarm system and no sprinkler system.

Part 6 – Recommendations

With the assumption on keeping the school operational for 3 more years we recommend the following in order of importance:

1. Install Sprinkler System
 - a. The building does not have a sprinkler system. According the code all educational facilities (K-12) larger than 20,000 sq. ft. shall have sprinklers. Since ownership and use group for the building has not changed the upgrade may not be triggered, however a meeting with building officials on subject is recommended.
2. Upgrade Fire Alarm
 - a. The system is outdated. We recommend that the existing fire alarm system be replaced.
3. Service Rooftop Units
 - a. All of the rooftop units (RTUs) have exceeded their expected lifespan. If the RTUs are serviced by a qualified contractor and the necessary recommended repairs are made the lifespan would be extended.
4. Replace/Service Roof Drains
 - a. Replace, service, and restore all roof drain domes. Patch roof as needed – see architectural report.
5. Replace/Repair Lighting Fixtures
 - a. Although the fixtures are in fair condition it is recommended that re-lamping in some cases and providing new lenses in other cases, where necessary.
6. Pipe Insulation
 - a. Pipes without insulation can remain. We recommend supplemental tankless water heaters be installed in or near the bathrooms to provide water.

Part 7 – Photographic Documentation



Outdated building fire alarm system.



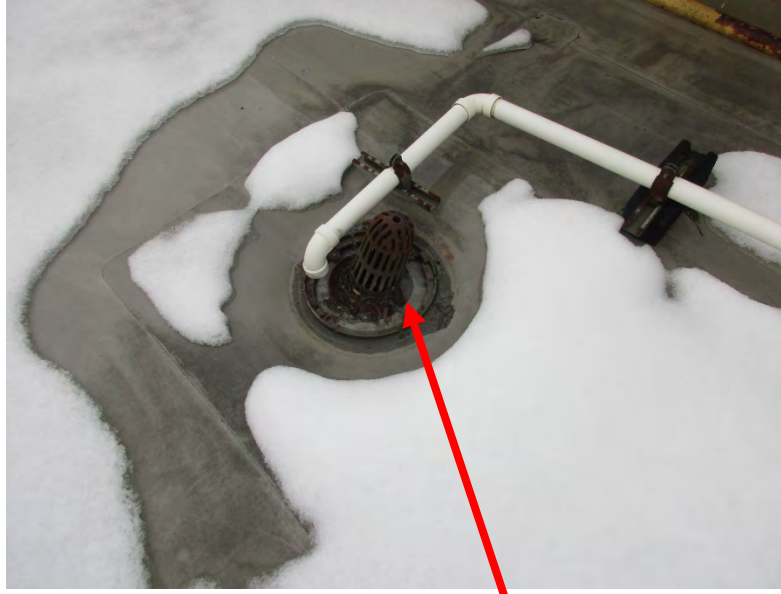
Electrical panelboards in boiler room in good condition.



Single domestic water heater with supplemental tank



Pool of water surrounding RTU supports on roof.



Broken roof drain dome.



Insulation on exterior duct peeling off.



Debris found inside RTU-12.



Broken supply flex duct above classroom ceiling.



Watermarks found on damaged ceiling tiles.



Patrick Henry School - Proposal to keep old school open

Two Interim Uses for the Old School Proposed:

1. Emergency Use for roof replacement at Mount Vernon School
 - a. Students would be temporarily relocated to the old Patrick Henry school from April – June 2019

City Action:

- a. Allow temporary emergency use of old school.
- b. PZ staff will coordinate this temporary use with core agencies to identify any issues (fire, SWM, sewer, traffic).
- c. Interim arrangements needed to address parking, coordination between arrival / departure time for the two schools, complete temporary grading and seeding of currently disturbed areas.
- d. Fire / Code do an inspection prior to re-occupancy;
- e. ACPS would address public outreach.
- f. Staff would inform PC and CC.

Checklist Items for ACPS on the Emergency Use of the School:

- ✓ Provide letter / narrative requesting the temporary use from April through May;
- ✓ Provide a full "building" code analysis to be provided by a registered design professional;
- ✓ Provide an interim parking plan for teacher / staff / recreation center;
- ✓ Determine if additional handicap spaces will be needed;
- ✓ Provide information on accessibility routes – from handicap parking to building and at entrances;
- ✓ Provide an interim parent drop off plan for each school building;
- ✓ Coordinate school bus arrival and departure plan for the entire site;
- ✓ Provide a plan for what elements of the site can still be completed under the approved site plan and how the site will be stabilized during this interim period;
- ✓ Monthly SWM / E&S controls inspections must continue under current permit;
- ✓ The old and new school share the same address which will likely need to result in the need for a new address number for one of the buildings;
- ✓ New address may trigger a new certificate of occupancy for the old school;
- ✓ Fire will need a list of all uses proposed for the entire site;
- ✓ All construction fencing will need to be removed when both schools are in use to all for fire department access;

- ✓ East side of the site will need to be made accessible as required in the approved site plan including highway loading to support emergency vehicles up to and beyond the East side of the new school;
 - ✓ The drive aisle / EVE on the West side of old building will need to remain free and clear of all construction, service, or other vehicles;
 - ✓ Full EVE (fire department) access will need to be maintained;
 - ✓ Access to the new school FDC at the main entrance will need to be accessible from the West side EVE road next to the old school;
 - ✓ Safe gathering spaces for students will need to be identified;
 - ✓ Fire ratings and building separation will need to be addressed;
 - ✓ Proposal for public outreach and communication with the public;
 - ✓ A site and building inspection is recommend by fire and City Code officials.
2. Use old Patrick Henry School while a new MacArthur School is constructed
- a. This would move most of the student body (some may still need to go to an additional swing space due to capacity at Patrick Henry.
 - b. Occur from September 2020 – September 2022
 - c. Upon opening of the new MacArthur school, the old Patrick Henry school would be demolished, and the new parking lot and athletic facilities completed pursuant to the approved DSUP. This work is expected to be complete by September 2023.

City Action:

- a. No action until more information is received from ACPS to confirm plans and timing for MacArthur school.
- b. An amendment to the DSUP for Patrick Henry would be likely.

Identified Issues:

- a. Schedule for this use has not been determined.
- b. Completion of the approved site plan for Patrick Henry school could be delayed until 2023.
- c. Primary athletic field and new parking would not be available.
- d. Potential impacts on use of the City's recreation center
- e. Old Patrick Henry school would not be in use from June 2019 – September 2020.
- f. Limited parking.
- g. Increased traffic.
- h. Proximity of the new and old schools and whether this meets adequate fire separation;
- i. FAR will be exceeded – can be addressed with a SUP.

Checklist Items for use of Patrick Henry as Swing Space for MacArthur School:

- ✓ Amend DSUP Site Plan to provide an interim phase to address use of existing school and any associated site design changes that need to be made;
- ✓ Specific issues to consider as part of the amended site plan:
 - Interim parking including handicap spaces and accessibility routes;
 - Interim recreational areas;
 - Interim SWM;
 - Interim fire safety;
 - Transportation and traffic;
- ✓ Obtain permits as necessary (SWM and grading permits);
- ✓ School should provide schedule for design work and construction of new MacArthur School;
- ✓ DSUP process will take about 6 months (includes final site plan approval);
- ✓ Public Hearings before PC and CC;
- ✓ Public outreach.