



ALEXANDRIA CITY PUBLIC SCHOOLS  
COMPREHENSIVE CONDITION AUDITS

- CORA KELLY ELEMENTARY SCHOOL
- FRANCIS C. HAMMOND MIDDLE SCHOOL
- GEORGE MASON ELEMENTARY SCHOOL
- GEORGE WASHINGTON MIDDLE SCHOOL
- MATTHEW MAURY ELEMENTARY SCHOOL
- TRANSPORTATION FACILITY

---

**A/E TEAM:**

**PRIME - HENRY ADAMS, LLC CONSULTING  
ENGINEERS**

**ARCHITECT - ECO-MAR, LLC**

**STRUCTURAL ENGINEER - ALBRECHT  
ENGINEERING, INC.**

**CIVIL ENGINEER - CLARK | AZAR &  
ASSOCIATES, INC.**

---

**Final Report - DRAFT**

**August 9, 2019**

## TABLE OF CONTENTS

I. EXECUTIVE SUMMARY .....	3
A. SUMMARY OF FINDINGS.....	X
B. SUMMARY OF RECOMMENDATIONS.....	X
C. REMEDIATION APPROACH.....	X
D. COST.....	X
II. METHODOLOGY.....	X
A. PROJECT DESCRIPTION.....	X
B. APPROACH.....	X
C. APPLICABLE CODES AND STANDARDS.....	X
III. DETAILED BUILDING AND DEFICIENCY DATA.....	X
A. CORA KELLY ELEMENTARY SCHOOL .....	X
B. FRANCIS C. HAMMOND MIDDLE SCHOOL .....	X
C. GEORGE MASON ELEMENTARY SCHOOL .....	X
D. GEORGE WASHINGTON MIDDLE SCHOOL .....	X
E. MATTHEW MAURY ELEMNTARY SCHOOL .....	X
F. TRANSPORTATION FACILITY .....	X
IV. APPENDICES OF ACPS EDUCATION FACILITY DATA USED.....	X
APPENDIX A – LIST OF FACILITY INSPECTION REPORTS PROVIDED TO A/E TEAM	
APPENDIX B - ELEVATOR CERTIFICATES	
APPENDIX C – GENERATOR INSPECTION REPORTS	
APPENDIX - ETC.	



## I. EXECUTIVE SUMMARY

### A. SUMMARY OF FINDINGS

The surveys (instead use “audits” or “assessments”) resulted in discovery of numerous issues and concerns contributing to current or future issues, leading to unsatisfactory conditions within the buildings. Issues discovered include the following:

- All schools and Transportation Facility - Although fuel-burning equipment and appliances are present in all of the buildings we surveyed (water heaters, boilers, kitchen equipment, etc.), there are no carbon monoxide detectors in the buildings. Carbon monoxide (CO) detection and warning equipment is a crucial life safety component.
  - Carbon monoxide is often called the invisible killer because it is an odorless, colorless, gas created when fuels (such as gasoline, wood, kerosene, coal, natural gas, propane, oil, and methane) burn incompletely.
  - In all buildings, heating and cooking equipment that burn fuel can be sources of carbon monoxide.
  - Other sources of carbon monoxide include vehicle or generator exhaust that is drawn into a building from an outdoor air intake, a door, or an open window.
  - Exposure to carbon monoxide may cause unconsciousness and death.
  - CO enters the body through breathing. CO poisoning can be confused with flu symptoms, food poisoning, and other illnesses. Some symptoms include shortness of breath, nausea, dizziness, light headedness or headaches. High levels of CO can be fatal, causing death within minutes.
  - Symptom severity is related to both the CO level and the duration of exposure. For slowly developing CO problems, occupants and physicians can mistake mild to moderate CO poisoning symptoms for the flu, which sometimes results in deaths. For rapidly developing, high-level CO exposures, victims can quickly become mentally confused, and can lose muscle control without having first experienced milder symptoms; they will likely die if not rescued.
- Cora Kelly – Water Issues, Aging HVAC Equipment Beyond its Useful Life, Missing and Damaged Duct exposed Duct Insulation on Roof, Rooftop HVAC Units Have High Curb Adapters or are Supported from Elevated Steel Structures Making Maintenance Difficult and Hazardous. Damaged Plumbing Fixtures in Toilet Rooms, Aging Domestic Water Heaters Beyond Useful Life
- George Mason – Roof Issues, Sewage Ejector System is not Properly Sealed and Missing Pump, Plumbing Fixtures not Properly Physically Sized for Current Age Group, HVAC Classroom Unit Ventilators are controlled manually by a Unit Mounted Toggle Switch, Roof Overflow Scuppers are not Readily Visible for Discharge, Stormwater from Roof Discharges at Foundation Wall,
- George Washington – Window Issues, No Ventilation Air in Classrooms Rooms A160 Through A165, Broken Sump Pump in Mechanical Equipment Room, Boiler Not Operational
- FC Hammond – Interior courtyard issues, Aging HVAC Equipment Beyond its Useful Life, Insulation Missing on Chilled Water Piping
- Transportation Facility – everything, Non-Functioning HVAC Equipment, Insufficient Restroom Facilities,

Aging Fume Extraction System in Garage, No Heat or Air in Various Areas of the Building

- Matthew Maury - Properly Support Gas Piping on Roof, Replaced Rooftop HVAC Units Have High Curb Adapters Making Maintenance Difficult and Hazardous. Stormwater from Roof Discharges at Foundation Wall, Excessive Moisture in Basement Mechanical Room, Numerous Crawl Space Vents are Sealed Preventing Proper Ventilation of Crawl Space

## **B. SUMMARY OF RECOMMENDATIONS**

A summary of recommendations for the facilities includes the following:

- **Priority 1.** Install carbon monoxide detection and warning equipment in all buildings.
- **Etc. . . .**

## **C. REMEDIATION APPROACH**

Option 1: Repairs to existing system:

- Roof replacement
- Damp proofing and drainage of foundation walls
- Window replacement
- Toilet room renovations
- Door replacements

## **D. COSTS**

- Roof replacement = \$250,000
- Damp proofing and drainage of foundation walls = \$300,000
- Window replacement = \$ 100,000
- Toilet room renovations = \$ 250,000
- Interior architecture finishes and doors - patching and refinishing = \$750,000
- (MEP)
- (Other)

**ACPS Targeted Condition Assessments - Planning Projections**

Site	Facility Type	Program	Priority	Program Details	Capacity/ Non- Capacity	Year Current CIP or TBD	Budget
<b>Cora Kelly</b>	<b>Elementary</b>	<b>Flooring Repair/Replace</b>	<b>1</b>	<b>This project will replace carpet.</b>	<b>N</b>	<b>2020</b>	<b>400,000</b>
Cora Kelly	Elementary	Roofing replacement	1	Replace all single-ply membrane roofs. Modify and renovate all roof drains, gutters and rain leaders	N	TBD	1,140,000
Cora Kelly	Elementary	Mitigate water issues under classroom 2	1	Provided drainage and ventilation to reduce humidity issues under floor and in classroom. Tnemec rust inhibitor paint on existing trusses and steel.	N	TBD	10,000
Cora Kelly	Elementary	Hydraulic Elevator addition in lobby	1	Provide a single 3500lb hydraulic elevator main lobby to second floor.	N	TBD	150,000
Cora Kelly	Elementary	Toilet rooms	1	Remodel boys and girls room on second floor	N	TBD	150,000
Cora Kelly	Elementary	Exterior duct insulation	1	Reinsulated the existing exterior ducts on the roof	N	TBD	75,000
Cora Kelly	Elementary	Carbon Monoxide Detectors	1	Install carbon monoxide detectors in fuel burning equipment spaces and adjacent space, and in communicating classrooms.	N	TBD	7,500
<b>Francis C. Hammond</b>	<b>Secondary</b>	<b>HVAC Repair or Replacement</b>	<b>1</b>	<b>This project will address heating issues in the cafeteria.</b>	<b>N</b>	<b>2020</b>	<b>222,395</b>
<b>Francis C. Hammond</b>	<b>Secondary</b>	<b>Site Hardscape Repair/Replacement</b>	<b>1</b>	<b>This project replaces pole-mounted light 400 W HPS Fixture.</b>	<b>N</b>	<b>2020</b>	<b>18,626</b>
Francis C. Hammond	Secondary	D-Wing Roof Repair or Replacement	1	This project will replace D wing roofs with white EPDM Membrane roof.	N	TBD	200,000
Francis C. Hammond	Secondary	Reconstruct toilet rooms in D-Wing	1	Reconstruct 2nd floor toilet rooms in D-Wing and spot repair and refinish 1st floor	N	TBD	150,000
Francis C. Hammond	Secondary	Repair and reconstruct floor slab	1	Repair and reconstruct floor slab at basement locker room corridor, provide floor drains and sump pump to alleviate future flooding.	N	TBD	40,000
Francis C. Hammond	Secondary	Basement Flooding prevention	1	Alleviate basement flooding from exterior wall at Stair 9. install basement wall waterproofing and French drain. Install multiple sump pumps and drainage piping.	N	TBD	500,000
Francis C. Hammond	Secondary	Carbon Monoxide Detectors	1	Install carbon monoxide detectors in fuel burning equipment spaces and adjacent space, and in communicating classrooms.	N	TBD	27,000
Francis C. Hammond	Secondary	Dust Collector Room	1	Evaluate and replace unsafe electrical distribution, address unsafe installation.	N	TBD	30,000
Francis C. Hammond	Secondary	Replace or repair HVAC equipment with known failures	1	Chilled water pump, exhaust fan	N	TBD	40,000
<b>George Mason</b>	<b>Elementary</b>	<b>Design, Project Management &amp; Other Soft Costs</b>	<b>1</b>	<b>These are the soft costs associated with the construction of the modernization program. This includes but is not limited to fees, permitting, design, project management, legal fees.</b>	<b>C</b>	<b>2023</b>	<b>8,007,990</b>
<b>George Mason</b>	<b>Elementary</b>	<b>Construction of Renovation &amp; Capacity</b>	<b>1</b>	<b>This includes hard costs associated with site work and construction of a new school with 700 student capacity.</b>	<b>C</b>	<b>2024</b>	<b>20,019,975</b>
George Mason	Elementary	Exterior envelope improvements	1	Roofing and gutters over historic building	N	TBD	200,000

Note: Red font indicates programs identified as a result of targeted condition assessments.

**ACPS Targeted Condition Assessments - Planning Projections**

Site	Facility Type	Program	Priority	Program Details	Capacity/ Non- Capacity	Year Current CIP or TBD	Budget
George Mason	Elementary	Water Remediation at Basement	1	Provide foundation water proofing and sump pumps at basement. Provide mold and A testing and mitigation. Focus attention on water removal around electrical equipment.	N	TBD	350,000
George Mason	Elementary	Existing Sewage Ejector	1	Replace existing duplex sewage ejector	N	TBD	15,000
George Mason	Elementary	Carbon Monoxide Detectors	1	Install carbon monoxide detectors in fuel buring equipment spaces and adjascent space, and in communicating classrooms.	n	TBD	7,500
<b>George Washington</b>	<b>Secondary</b>	<b>HVAC Repair or Replacement</b>	<b>1</b>	<b>This project will replace HVAC equipment which has reached the end of its life-cycle.</b>	<b>N</b>	<b>2020</b>	<b>152,403</b>
<b>George Washington</b>	<b>Secondary</b>	<b>Renovations &amp; Reconfigurations</b>	<b>1</b>	<b>This project will perform renovation work to 3rd floor classrooms including flooring.</b>	<b>N</b>	<b>2021</b>	<b>558,000</b>
<b>George Washington</b>	<b>Secondary</b>	<b>HVAC Repair or Replacement</b>	<b>1</b>	<b>This project will replace HVAC equipment which has reached the end of</b>	<b>N</b>	<b>2022</b>	<b>47,497</b>
<b>George Washington</b>	<b>Secondary</b>	<b>Fire Alarm System</b>	<b>1</b>	<b>This funding replaces fire pumps, 40 HP, 500-gal.</b>	<b>N</b>	<b>2023</b>	<b>54,379</b>
<b>George Washington</b>	<b>Secondary</b>	<b>HVAC Repair or Replacement</b>	<b>1</b>	<b>This project will replace HVAC equipment which has reached the end of its life-cycle.</b>	<b>N</b>	<b>2023</b>	<b>159,840</b>
<b>George Washington</b>	<b>Secondary</b>	<b>HVAC Repair or Replacement</b>	<b>1</b>	<b>This project will replace ductless miniplate.</b>	<b>N</b>	<b>2024</b>	<b>13,802</b>
George Washington	Secondary	ACM and Mold mitigation	1	Basement ACM and Mold Testing and mitigation and repainting	N	TBD	350,000
George Washington	Secondary	Safety ladders	1	New Safety ladders and roof hatches	N	TBD	20,000
George Washington	Secondary	Ventilation to Courtyard Classrooms	1	Provide ventilation air to classrooms A160 thru A165 from existing air handling units	N	TBD	40,000
George Washington	Secondary	Chiller Replacement	1	Replace existing chiller that is not operatonal	N	TBD	275,000
George Washington	Secondary	Sump Pump Replacement	1	Replace existing sump pump in the mechanical equipment room	N	TBD	5,000
George Washington	Secondary	Boiler Replacement	1	Replace the existing no functional boiler	N	TBD	
George Washington	Secondary	Carbon Monoxide Detectors	1	Install carbon monoxide detectors in fuel buring equipment spaces and adjascent space, and in communicating classrooms.	N	TBD	27,000
Matthew Maury	Elementary	Roofing replacement	1	Replace all single ply roofing and reconstruct and extend gutters	N	TBD	950,000
Matthew Maury	Elementary	Addition Damper and Heat	1	Provide addiontional control damper and reheat to Music Room 12	N	TBD	6,000
Matthew Maury	Elementary	Carbon Monoxide Detectors	1	Install carbon monoxide detectors in fuel buring equipment spaces and adjascent space, and in communicating classrooms.	N	TBD	7,500
<b>Transportation Services</b>	<b>Other</b>	<b>Transportation Facility Modernization</b>	<b>1</b>	<b><del>This project includes an upgrade of the existing facility to modernize and meet capacity needs, pending the Witter Wheeler Campus Study (included in line 41)</del></b>	<b>C</b>	<b>2022</b>	<b>6,710,000</b>
Transportation Services	Other	Transportation Facility Modernization - Additional needed funds to renovate and to current funds	1	These are the additional funds required to make a full renovation of the existing building	C	TBD	1,690,000
Transportation Services	Other	Transportation Facility Modernization - Additional needed funds for new facility	1	This are the funds to build a completely new facility	C	TBD	7,600,000
Transportation Services	Other	Roof Replacement	1	Replace standing seem roof with an insulated low slop multi-ply roof with reconfigured gutters	N	TBD	475,000
Transportation Services	Other	Toilet room renovations and expansion	1	Expand and reconfigure toilet rooms with ADA compliant toilets that have fixtures that will meet the standard and the volume of need between shifts	N	TBD	250,000

Note: Red font indicates programs identified as a result of targeted condition assessments.

**ACPS Targeted Condition Assessments - Planning Projections**

Site	Facility Type	Program	Priority	Program Details	Capacity/ Non-Capacity	Year Current CIP or TBD	Budget	
Transportation Services	Other	ACM and Mold testing	1	Provide ACM and mold testing and mitigate	N	TBD	150,000	
Transportation Services	Other	Garage Fume Extraction	1	Provide new vehicle fume extraction	N	TBD	35,000	
Transportation Services	Other	HVAC Replacement	1	Provide replacement HVAC system	N	TBD	175,000	
Transportation Services	Other	Carbon Monoxide Detectors	1	Install carbon monoxide detectors in fuel burning equipment spaces and adjacent space.	N	TBD	3,000	
Transportation Services	Other	Emergency Lighting	1	Add emergency lighting unit in stairwell	N	TBD	1,000	
<b>SUBTOTAL: PRIORITY 1</b>		<b>Currently Critical - Requires immediately attention</b>						<b>44,806,407</b>
<b>Cora Kelly</b>	<b>Elementary</b>	<b>Kitchen/ Cafeteria renovation and reconfigurations</b>	<b>2</b>	<b>This project funds contingency for kitchen upgrades as recommended in the B&amp;D assessment and funded in FY 2019.</b>	<b>N</b>	<b>2020</b>	<b>75,515</b>	
<b>Cora Kelly</b>	<b>Elementary</b>	<b>Design, Project Management &amp; Other Soft Costs</b>	<b>2</b>	<b>These are the soft costs associated with the construction of the modernization program. This includes but is not limited to fees, permitting, design, project management, legal fees.</b>	<b>C</b>	<b>2026</b>	<b>6,045,458</b>	
<b>Cora Kelly</b>	<b>Elementary</b>	<b>Construction of Renovation &amp; Capacity</b>	<b>2</b>	<b>This includes hard costs associated with site work, construction and renovation of the existing school and an additional 10 modular classrooms plus 12 pre-K classrooms</b>	<b>C</b>	<b>2027</b>	<b>30,227,289</b>	
Cora Kelly	Elementary	Partial Window replacement	2	Replace 30 windows and sills and provide caulking	N	TBD	60,000	
Cora Kelly	Elementary	Packaged Rooftop HVAC Units	2	Replace the existing gas fired packaged rooftop units	N	TBD	400,000	
Cora Kelly	Elementary	Domestic water heaters	2	Replace the existing gas fired domestic water heaters	N	TBD	38,000	
Cora Kelly	Elementary	Fully sprinkler building	2	Provide sprinkler system for unsprinklered portion of the building	N	TBD	450,000	
Cora Kelly	Elementary	Emergency and Exit Lighting	2	Evaluate existing system adequacy and provide supplemental emergency	N	TBD	75,000	
<b>Francis C. Hammond</b>	<b>Secondary</b>	<b>HVAC Repair or Replacement</b>	<b>2</b>	<b>This project will replace HVAC equipment which has reached the end of its life-cycle.</b>	<b>N</b>	<b>2021</b>	<b>186,696</b>	
<b>Francis C. Hammond</b>	<b>Secondary</b>	<b>HVAC Repair or Replacement</b>	<b>2</b>	<b>This project will replace HVAC equipment which has reached the end of its life-cycle.</b>	<b>N</b>	<b>2022</b>	<b>189,555</b>	
<b>Francis C. Hammond</b>	<b>Secondary</b>	<b>Storm water management</b>	<b>2</b>	<b>This project funds major maintenance required on the tree box filter BMP.</b>	<b>N</b>	<b>2022</b>	<b>60,000</b>	
<b>Francis C. Hammond</b>	<b>Secondary</b>	<b>Roof Repair or Replacement</b>	<b>2</b>	<b>This project will replace single ply SCO White EPDM Membrane roof.</b>	<b>N</b>	<b>2024</b>	<b>873,758</b>	
<b>Francis C. Hammond</b>	<b>Secondary</b>	<b>Renovations &amp; Reconfigurations</b>	<b>2</b>	<b>This project will repair leaking windows in the cafeteria.</b>	<b>N</b>	<b>2020</b>	<b>40,000</b>	
Francis C. Hammond	Secondary	Courtyard generated flooding prevention	2	Regrade courtyards. Create subsurface storm drain piping and connect to roof rain leaders. Install waterproofing and foundation drains at basement wall	N	TBD	350,000	
Francis C. Hammond	Secondary	Emergency and Exit Lighting	2	Evaluate existing system adequacy and provide supplemental emergency lighting units	N	TBD	200,000	
George Mason	Elementary	Elevator replacement	2	Replace existing elevator with a 2-stop custom 2500lb hydraulic	N	TBD	200,000	
George Mason	Elementary	Roof Drainage	2	Redirect roof downspouts away from building toward stormwater inlets	N	TBD	5,000	
George Mason	Elementary	HVAC System	2	Replace HVAC systems with new system	N	TBD	1,750,000	
<b>George Washington</b>	<b>Secondary</b>	<b>Renovations &amp; Reconfigurations</b>	<b>2</b>	<b>This project will perform renovation work to 2nd floor classrooms including flooring.</b>	<b>N</b>	<b>2020</b>	<b>650,000</b>	
George Washington	Secondary	Additional resilient flooring	2	Remove carpets and old flooring and install new resilient flooring in all classrooms (in addition to above line item)	N	TBD	600,000	

Note: Red font indicates programs identified as a result of targeted condition assessments.

**ACPS Targeted Condition Assessments - Planning Projections**

Site	Facility Type	Program	Priority	Program Details	Capacity/ Non- Capacity	Year Current CIP or TBD	Budget
George Washington	Secondary	Water heaters/boilers repair/replace	2	This project will replace HVAC equipment which has reached the end of its life-cycle.	N	2022	53,371
George Washington	Secondary	NETA Testing	2	Testing agency to clean, inspect and test equipment exposed to deteriorating agents.	N	TBD	35,000
Matthew Maury	Elementary	Construction of Renovation & Capacity	2	This includes hard costs associated with site work, construction and renovation of the existing school and an additional 2 modular.	C	2030	30,338,004
Matthew Maury	Elementary	Design, Project Management & Other Soft Costs	2	These are the soft costs associated with the construction of the modernization program. This includes but is not limited to fees, permitting, design, project management, legal fees.	C	2030	6,067,601
Matthew Maury	Elementary	Kitchen/ Cafeteria renovation and reconfigurations	2	This project funds kitchen upgrades as recommended in the B&D assessment.	N	2020	812,854
Matthew Maury	Elementary	Interior Acoustics/Lighting	2	This project will replace stage lighting and audio amplification systems.	N	2021	91,383
Matthew Maury	Elementary	Interior floor finishes	2	Replace carpeting with resilient flooring.	N	TBD	250,000
Matthew Maury	Elementary	Exterior Painting	2	Paint exterior trims, cornices, built in gutter and related items	N	TBD	200,000
Matthew Maury	Elementary	Masonry and settlement repairs	2	Brick repair and repointing, sealant at joints, and new sills. Rebuild exterior concrete exit stairs.	N	TBD	200,001
Matthew Maury	Elementary	Exterior Window replacement	2	Replace existing wood windows with new commercial aluminum framed windows to match profile and aesthetic	N	TBD	1,000,000
Matthew Maury	Elementary	Entry Lobby	2	New security vestibule with ADA compliant entrance. Provide a new wheel chair lift.	C	TBD	300,000
Matthew Maury	Elementary	Roof Drainage	2	Redirect roof downspouts away from building toward stormwater inlets	N	TBD	5,000
Matthew Maury	Elementary	Upgrade Plumbing Fixtures	2	Upgrade plumbing fixtures to more age appropriate sizes	N	TBD	25,000
Matthew Maury	Elementary	Domestic Water Heaters	2	Replace the existing gas fired domestic water heaters	N	TBD	38,000
Matthew Maury	Elementary	Emergency and Exit Lighting	2	Evaluate existing system adequacy and provide supplemental emergency lighting units	N	TBD	75,000
Transportation Services	Other	Foundation/ Basement wall	2	Excavate and install waterproofing, foundation drainage and repair and seal wall cracks	N	TBD	300,000
Transportation Services	Other	Interior finishes and doors	2	Replace all interior doors, repaint all walls, replace ceilings, and replace flooring.	N	TBD	400,000
Transportation Services	Other	Unit Heater Replacement	2	Replace existing unit heaters	N	TBD	25,000
Transportation Services	Other	Boiler and Pumps	2	Provide new boiler and pumps	N	TBD	40,000
<b>SUBTOTAL: PRIORITY 2</b>		<b>Potentially Critical - Will become critical within 2 years</b>					<b>82,732,483</b>
Cora Kelly	Elementary	Plumbing fixtures	3	Replace plumbing fixtures in the original portion of the building	N	TBD	45,000
Cora Kelly	Elementary	Sprinkler backflow preventor	3	Relocated the sprinkler backflow preventor and main valve to a more accessible location	N	TBD	12,000
Cora Kelly	Elementary	Panelboard	3	Replace obsolete panelboard	N	TBD	7,500
Francis C. Hammond	Secondary	Interior/Exterior Painting	3	This project will perform life-cycle painting.	N	2020	318,000
Francis C. Hammond	Secondary	HVAC Repair or Replacement	3	This project will replace HVAC equipment which has reached the end of its life-cycle.	N	2023	138,228
Francis C. Hammond	Secondary	Interior/Exterior Painting	3	This project will perform life-cycle painting.	N	2027	295,156
Francis C. Hammond	Secondary	Renovations & Reconfigurations	3	This project will add LED lighting to main and auxiliary gym.	N	2020	85,000

Note: Red font indicates programs identified as a result of targeted condition assessments.



**ACPS Targeted Condition Assessments - Planning Projections**

Site	Facility Type	Program	Priority	Program Details	Capacity/ Non- Capacity	Year Current CIP or TBD	Budget	
Francis C. Hammond	Secondary	Auditorium Renovation	3	Full Auditorium renovation of finishes, seating, lighting and HVAC system	N	TBD	2,000,000	
Francis C. Hammond	Secondary	Finishes renovations	3	Ceiling finishes replacement and wall painting in main wings. Full painting, flooring and ceiling at locker room and basement fitness areas	N	TBD	500,000	
Francis C. Hammond	Secondary	Panelboard	3	Replace obsolete panelboards	N	TBD	56,000	
George Mason	Elementary	Window Replacement	3	Comprehensive Window Replacement with commercial grade energy efficient windows with history profiles and customer sizes	N	TBD	1,000,000	
George Mason	Elementary	Interior architectural renovations	3	Renovate all interior classrooms and associated rooms including: closet door replacement, millwork, flooring replacement, ceiling replacement, painting.	N	TBD	1,000,000	
George Mason	Elementary	Toilet room modernization	3	Renovated existing toilets to meet ADA requirements and for modernization and functional improvement	N	TBD	250,000	
George Mason	Elementary	Panelboards	3	Replace obsolete panelboards and paneboard in boiler room	N	TBD	32,000	
<b>George Washington</b>	<b>Secondary</b>	<b>Interior/Exterior Painting</b>	<b>3</b>	<b>This project will perform life-cycle painting.</b>	<b>N</b>	<b>2024</b>	<b>296,665</b>	
George Washington	Secondary	Exterior Windows	3	Replacement of Historic windows along western façade of Building A	N	TBD	400,000	
<b>Matthew Maury</b>	<b>Elementary</b>	<b>Interior/Exterior Painting</b>	<b>3</b>	<b>This project will perform life-cycle painting.</b>	<b>N</b>	<b>2024</b>	<b>206,055</b>	
Matthew Maury	Elementary	Gas Piping Supports	3	Replace natural gas piping supports on roof	N	TBD	7,500	
Transportation Services	Other	Window Replicant	3	Replace existing windows with new commercial grade aluminum windows	N	TBD	100,000	
Transportation Services	Other	Misc. Repair	3	Add outlets,address misc. repairs	N	TBD	3,000	
<b>SUBTOTAL: PRIORITY 3</b>		<b>Necessary - Not Yet Critical - Attention to Preclude further deterioration</b>						<b>6,752,104</b>
<b>Cora Kelly</b>	<b>Elementary</b>	<b>Site Hardscape Repair/Replacement</b>	<b>4</b>	<b>This project will (1) repair the rusted and broken bench (2) repair cracked and damaged basketball court surface to provide consistent surface for play and proper drainage (3) provide proper barrier to prevent baseballs from hitting building and skylights.</b>	<b>N</b>	<b>2020</b>	<b>60,000</b>	
Cora Kelly	Elementary	Full window replacement	4	Replace all windows and sills with caulking	N	TBD	500,000	
Cora Kelly	Elementary	Wall refinishing	4	Replace concrete backer board panels, prep an repaint	N	TBD	200,000	
Cora Kelly	Elementary	Preventive Maintenance	4	Implement preventive maintenance program - annual	N	TBD	10,000	
Cora Kelly	Elementary	Fire Alarm & Voice Evacuation System	4	Replace fire alarm system	N	TBD	210,000	
<b>Francis C. Hammond</b>	<b>Secondary</b>	<b>Exterior Playgrounds or Sports Areas</b>	<b>4</b>	<b>This project will upgrade the existing tennis courts to a multi-use grid court.</b>	<b>N</b>	<b>2020</b>	<b>380,000</b>	
Francis C. Hammond	Secondary	Preventive Maintenance	4	Implement preventive maintenance program - annual	N	TBD	20,000	
Francis C. Hammond	Secondary	Fire Alarm & Voice Evacuation System	4	Replace fire alarm system	N	TBD	750,000	
Francis C. Hammond	Secondary	Lighting Controls	4	This project will install code compliant, occupancy based lighting controls	N	TBD	250,000	

Note: Red font indicates programs identified as a result of targeted condition assessments.

**ACPS Targeted Condition Assessments - Planning Projections**

Site	Facility Type	Program	Priority	Program Details	Capacity/ Non- Capacity	Year Current CIP or TBD	Budget
George Mason	Elementary	Fire Alarm & Voice Evacuation System	4	Replace fire alarm system	N	TBD	150,000
George Mason	Elementary	Preventive Maintenance	4	Implement preventive maintenance program - annual	N	TBD	10,000
<b>George Washington</b>	<b>Secondary</b>	<b>Exterior Playgrounds or Sports Areas</b>	<b>4</b>	<b>This project includes track &amp; field improvements.</b>	<b>N</b>	<b>2022</b>	<b>2,500,000</b>
<b>George Washington</b>	<b>Secondary</b>	<b>Exterior Playgrounds or Sports Areas</b>	<b>4</b>	<b>This project will improve exterior playgrounds/sports areas.</b>	<b>N</b>	<b>2026</b>	<b>15,000</b>
<b>George Washington</b>	<b>Secondary</b>	<b>Exterior Playgrounds or Sports Areas</b>	<b>4</b>	<b>This project includes improvements to Braddock field.</b>	<b>N</b>	<b>2026</b>	<b>371,000</b>
George Washington	Secondary	Exterior Masonry Repointing	4	Select Repointing of exterior masonry	N	TBD	150,000
George Washington	Secondary	Fire Alarm & Voice Evacuation System	4	Replace fire alarm system	N	TBD	750,000
George Washington	Secondary	Preventive Maintenance	4	Implement preventive maintenance program - annual	N	TBD	30,000
Matthew Maury	Elementary	Remove Abandoned Boiler	4	Remove existing abandoned boiler and clean room	N	TBD	25,000
Matthew Maury	Elementary	Fire Alarm & Voice Evacuation System	4	Replace fire alarm system	N	TBD	150,000
Matthew Maury	Elementary	Preventive Maintenance	4	Implement preventive maintenance program - annual	N	TBD	10,000
Matthew Maury	Elementary	Lighting Controls	4	This project will install code compliant, occupancy based lighting controls	N	TBD	250,000
Transportation Services	Other	Fire Alarm System	4	Replace fire alarm system	N	TBD	100,000
Transportation Services	Other	Preventive Maintenance	4	Implement preventive maintenance program - annual	N	TBD	10,000
Transportation Services	Other	Replace Electrical System	4	Replace entire electrical distribution system for the facility	N	TBD	100,000
Transportation Services	Other	Generator Power	4	Provide generator power to essential and critical loads using existing generator	N	TBD	15,000
<b>SUBTOTAL: PRIORITY 4</b>		<b>Recommended - represent a sensible improvement to existing conditions</b>					<b>7,016,000</b>
<b>TOTAL ALL PRIORITIES</b>							<b>141,306,994</b>

Note: Red font indicates programs identified as a result of targeted condition assessments.



## II. METHODOLOGY

### A. PROJECT DESCRIPTION

HENRY ADAMS, LLC performed this work for the Alexandria City Public Schools (ACPS) system under Contract # 2019082. This work included conducting physical surveys of the following six facilities in order to provide comprehensive condition audits and plant capital renewal analyses:

- Cora Kelly Elementary School  
3600 Commonwealth Avenue
- Francis C. Hammond Middle School  
4646 Seminary Road
- George Mason Elementary School  
2601 Cameron Mills Road
- George Washington Middle School  
1005 Mount Vernon Avenue
- Matthew Maury Elementary School  
600 Russell Road
- ACPS Transportation Facility  
3540 Wheeler Avenue

The goal of this project is to assist ACPS in gathering detailed information on poorly performing facilities in order for ACPS to provide adequate teaching and learning environments for students and staff, and to improve deferred maintenance over time.

### B. APPROACH

Under this contract, the assessment team consisted of the following disciplines:

- HENRY ADAMS, LLC – MEP Systems
- ECO-MAR, LLC – Architecture
- Clark | Azar & Associates, Inc. – Civil
- Albrecht Engineering, Inc. – Structural

HENRY ADAMS, LLC provided project management and assessment of mechanical, electrical and fire protection systems. ECO-MAR, LLC provided architectural assessment of envelope, roofing, and code compliance issues. Clark | Azar & Associates provided civil engineering and site assessments, and Albrecht Engineering, Inc. provided structural assessments.

Between June 19, 2019 and August 2, 2019, the team conducted comprehensive condition audits of each facility to document the following:

- The present condition of the facility in terms of deferred maintenance, capital renewal, and building

and life safety code deficiencies.

- Whether the physical plant functionally meets the needs of the facility.
- What funding and management programs are required to maintain the functional operations of the physical plant.

A/E team personnel performed condition audits by observing and recording issues discovered within each discipline. In addition, the consultant team reviewed the documents available from ACPS to better understand each building's current materials, systems, and equipment. ACPS facilities staff provided valuable support and information regarding known issues with equipment failures, maintenance and repair history, humidity issues, and water intrusion issues.

### C. METHODOLOGY DESCRIPTION

The A/E team prioritized the deficiencies identified in the condition audits based on following criteria.

- Priority 1. Currently Critical. Conditions in this category require immediate action to perform the following:
  - Correct a sited safety hazard.
  - Stop accelerated deterioration.
  - Return a facility to operation.
- Priority 2. Potentially Critical. Conditions in this category, if not corrected expeditiously, will become critical within 2 years. Situations in this category include the following:
  - Intermittent operations.
  - Rapid deterioration.
  - Potential life safety hazards.
- Priority 3. Necessary – Not yet critical. Conditions in this category require appropriate attention to preclude predictable deterioration or potential downtime and the associated damage or higher costs if deferred further.
- Priority 4. Recommended. Conditions in this category include items that represent a sensible improvement to existing conditions. These are not required for the most basic function of the facility, however, Priority 4 projects will improve the overall usability and/or reduce long-term maintenance costs.

The team was tasked to identify and make recommendations for several deficiency categories. Each correction project identified shall be assigned one of the following categories:

- Life-Safety Code Compliance
- Building Code Compliance
- Accessibility Code Compliance (ADA & Accessibility Standards)
- Building Integrity
- Functionality
- Appearance
- Energy
- Environmental: (as provided in client-supplied facilities condition data)
  - ACBM (asbestos containing building materials)
  - PCBs (polychlorinated biphenyls)
  - Lead-based Paints

- CFCs (Chlorofluorocarbons)
- IAQ (indoor air quality)
- Water Quality
- Indoor Air Quality (potential mold)

#### **D. APPLICABLE CODES AND STANDARDS**

We assessed each facility's current conditions as they relate to the following codes currently mandated by the City of Alexandria:

1. Virginia Uniform Statewide Building Code, 2015
2. Virginia Statewide Fire Prevention Code, 2015
3. Virginia Public Building Safety Regulations
4. Virginia Mechanical Code, 2015
5. Virginia Plumbing Code, 2015
6. Virginia Fuel Gas Code, 2015
7. Virginia Energy Conservation Code, 2015
8. Virginia Existing Building Code, 2015
9. Virginia Maintenance Code, 2015
10. NFPA 70, 2014, National Electrical Code
11. NFPA 72, 2013, National Fire Alarm and Signaling Code
12. NFPA 13, 2013, Standard for the Installation of Sprinkler Systems
13. NFPA 101, 2012, National Fire Protection Association – Life Safety Code
14. ASME A17.1, Safety Code for Elevators and Escalators
15. ASME A18.1, Safety Standard for Platform Lifts and Stairway Chairlifts
16. ADA Standards for Accessible Design, 2010

### III. DETAILED BUILDING AND DEFICIENCY DATA

A. The following chapters . . . provide details on building deficiencies that need to be corrected . . .

III A. CORA KELLY ELEMENTARY SCHOOL



## GENERAL

### B. FACILITY DESCRIPTION

Henry Adams, LLC was tasked by the Alexandria City Public Schools (ACPS) System to conduct a physical survey to provide ACPS with a targeted condition assessment documenting conditions and issues at the Cora Kelly Elementary School. The School is scheduled to be replaced as soon as 2026 if budgets allow. For this study, some sensitivity is being given to the interim measures to provide best value investments.

Cora Kelly Elementary School is a 69,000-SF masonry building on an 8.2-acre site. The property was originally constructed in 1955 and has undergone multiple renovations, including connection of the gym in 1991, window replacements in 1994, and a classroom addition in 1996. The building has received recent Phase 1 renovations to the roofing system, including a vegetative roof. It was also communicated to the team that additional Phase 2 roofing renovations were forthcoming.

The building's envelope consists of brick veneer on concrete block. Above the windows installed in 1994, there is a transom infill constructed of EIFS on a steel stud back up wall. The base of those walls is concrete backer board laminated to the concrete block.

There are a variety of roofing drainage configurations with interior drains and perimeter gutters. The roofing system is a single-ply membrane roof on insulation, which was recently added on the north-east end of the building with a vegetative roof over classrooms 24-27. The south-west end of the building also has a single-ply membrane roof that is pending replacement.

Water intrusion has been a problem due to aging roofs. In addition, the building is built on a flood plain and is vulnerable to floods, particularly because it relies on sandbag measures to prevent significant flooding in the building interior. There have also been water intrusion issues with the floors of classroom 2, but these may be due to internal plumbing failures, as ground water is not likely to be a source.

The surveys resulted in discovery of numerous issues and concerns contributing to unsatisfactory conditions within the building.

Remediation action associated with each of the deficiency are identified in SECTION III. RECOMMADATIONS.

### B. SUMMARY OF FINDINGS

The surveys resulted in discovery of numerous issues and concerns contributing to unsatisfactory conditions within the building. Refer to Section II. FINDINGS for detailed description of issued discovered. In summary, the following issues were discovered:

- Single-ply membrane roofs have been undergoing replacements that have covered half of the roof areas.

The remaining areas are still vulnerable to leaks and require patching. In addition, mechanical penetration and duct insulation have been damaged, contributing to water infiltration issues.

- The aluminum insulated windows are sweating and show thermal integrity failures that suggest a need for replacement. However, the county is currently undertaking select replacement of about 30 windows and replacing damaged sills as well as caulking around windows and sills.
- Entry wall and similar exit walls comprise an aged construction system built prior to the current security and energy concerns. Also, they are poorly built and should be considered for replacement.
- There appear to be under-floor water issues in classroom 2. Given the nature of the building being built with a crawl space below, we don't think the water is coming from subsurface ground sources, but it may result from an under-floor plumbing issue either in the domestic water systems or the fire suppression plumbing under this area.
- Leaks and water damage created stains in the ceilings and blemishes in the wall finishes. Though the source of the damage may have been controlled, the finishes need to be fixed.
- Second floor bathrooms are in poor condition.
- Currently, there is no elevator or lift to make the second floor accessible. This is a project that is in the budgeting and contracting process.
- In the past, ACPS has identified asbestos tiles and mastic throughout the building. Therefore, it is recommended that the county continue to remediate these materials as they become exposed or are no longer entombed.
- The school's 14 packaged rooftop units that were installed in 1994 are well beyond their useful life.
- The exposed ductwork on the roof is in poor condition allowing for energy loss and water infiltration.
- There is evidence of water ponding on some of the ducts.
- There is ductwork where the insulation is damaged and missing in areas, exposing the ducts.
- The present roof drainage appears to allow for some ponding in areas.
- In the "well" area of the roof there is construction debris that is causing water dams preventing the water from getting to the drains.
- Most of the plumbing fixtures in the original portion of the building are generally in poor condition. The fixtures are also not up to current standards for water consumption.
- There are two domestic water heaters that are beyond their useful life.
- The building does not have full fire sprinkler protection. Only the new wing is sprinklered.
- The backflow preventor and main valve for the sprinkler service, located in the crawl space, has caused water issues in the past when leaks have occurred.
- Placement and quantity of the battery pack emergency lighting units appears to be inadequate to provide the required minimum illumination level during a power outage.
- Fire alarm pull station mounting heights are not ADA compliant.
- Recessed panelboards installed in the corridors exceed the maximum mounting height limitation of NFPA 70.
- The school's fire alarm and detection system is outdated and has served beyond its useful life expectancy. The system is also non-ADA compliant.
- The transformer that served modular classrooms is operating with no-load losses continuously on

24/7 basis and is wasting energy.

- The building uses fossil fuel burning equipment (boiler). However, required carbon monoxide detectors or alarms are not installed.
- The library does not have adequate fire alarm notification devices and emergency battery pack units.
- The cafeteria service counter has an open floor outlet that is missing a cover plate, exposing live conductors and creating life safety hazard.

### **C. REMEDIATION APPROACH**

- Engage a construction manager to perform these renovations over a multi-year period, including summer and other breaks.
- Reassess current budgets and priorities to align with critical spending and long-range best value investments.

### **D. COST**

Refer to APPENDIX XX for ROM estimate associated with each remediation project identified.



## FINDINGS

### B. ARCHITECTURAL

#### a. ROOFING

The roofing at Cora Kelly Elementary is a low slope single-ply membrane system with a variety of drainage conditions from sloped to roof drains to sheet flow to perimeter gutters. There is a new single-ply low sloped roof installed above the corridor from classrooms 1 -18 and 19-23 and a newer a vegetative roof (extensive palleted) was also installed over classrooms 24-27. This was completed as Phase 1 of the roofing repair and replacement. Phase 2 has not been completed and will include the areas that were not part of Phase 1. Over these areas, which include the classroom 30-35 corridor, the administration area, the cafeteria and gym, there was evidence of pooling water and some roofing systems failures. These have led to leaks and damages to finishes in the areas below. It was the understanding of the survey team that the roof replacement project for Phase 2 is intended to move forward soon.

#### b. EXTERIOR WALLS

The exterior walls are predominantly brick veneer on concrete masonry. Visual inspection shows that joint repair and pointing of mortar for exterior brick is needed in limited areas (see Figure 1).

Many classrooms have concrete backer board paneling laminated to the concrete masonry under the windows, which appears to have been done for durability. This paneling is separating in many cases because of thermal issues on this part of the wall. Eventually, this detail should be revised and replaced with a standard furring and insulated system with plaster tape and skim coating finish (Figure 2).

The exit door at the north-east end of the building opens to a landing. There is a stair and ramp. The ramp is not ADA compliant.

#### c. WINDOWS

The entrance design consists of an aluminum framed non-insulated wire glass window wall and entry and exit doors. The detail has not weathered well, and the glass will not provide the thermal performance needed. The window and door frames at the main entrance should be redesigned and renovated to include the current thermal and security requirements. Similar details are also found in the courtyard exits at classroom 27 and the exit near classroom 24. These should also be redesigned and reconstructed.

During the survey, the team looked for problems and failures in the window system. Approximately 10 percent of the windows are facing gasket failures, causing sweating on the window panels (Figure 3). We encountered this in nine classrooms (see survey matrix), lobby, and cafeteria.

#### **d. STORMWATER DRAINAGE**

The building was constructed in a flood plain. The building ground floor is constructed on an elevated slab (with steel trusses) over a crawl space that is no longer ventilated. There has been evidence of water infiltration through the floors in this area. Classroom 2 has consistent water intrusion through the floor. There is further investigation to determine the source, as it is unlikely to be ground water.

Storm water roof drainage occurs through a combination of perimeter gutters and central roof drains. This system does not appear to be experiencing failure.

There are crawl spaces that are required to be ventilated. Many of the vents may have been blocked. This may create damaging humidity build-up around the structures of the floor slab. Therefore, we suggest creating new ventilation grates and potentially using fan ventilators in these areas.

#### **e. INTERIOR REPAIRS**

About 37 rooms need minor fixes in the acoustic ceiling panels. There is evidence of past leaks as evidenced by stained ACP in 9 classrooms (Figure 4). Other issues include: many aged carpets that are well beyond their service life; 20 rooms in need of carpet replacement (Figure 5); 22 rooms--including 19 classrooms--have wall finishing issues such as wall and plaster cracks; 9 rooms have issues such as wall peeling and bubbling (Figure 6).

Several of the classrooms need minor millwork repairs on the plastic laminate and should look at more durable and lasting materials and/or impact resistant details for edges (Figure 7).

### **C. MECHANICAL, PLUMBING AND FIRE PROTECTION**

#### **a. HVAC Systems**

The schools 14 packaged rooftop units that were installed in 1994 are well beyond their useful life and should be replaced. Although most of the units appear to be functioning currently, there have been reports that several heat exchangers have been replaced and there is heavy damage on the condenser fins on several of the units, which can affect the performance of the unit. Most

of the units are elevated on structural steel or on roof curb adapters and do not have service platforms, making service of the units difficult and hazardous as it has to be performed by ladder.

The units are equipped with gas heat and are sized as follows:

RTU-1	15 tons
RTU-2	7.5 tons
RTU-3	12.5 tons
RTU-4	17.5 tons
RTU-5	17.5 tons
RTU-6	17.5 tons
RTU-7	17.5 tons
RTU-8	6 tons
RTU-9	12.5 tons
RTU-10	6 tons
RTU-11	20 tons
RTU-12	12 tons
RTU-13	3 tons
RTU-14	6 tons

The exposed ductwork on the roof is in poor condition allowing for energy loss and water infiltration. There is evidence of water ponding on some of the ducts and there are others where insulation is damaged and missing in areas, exposing the ducts. All the exterior ducts should be reinsulated, and the condition of the ducts inspected when the existing insulation is removed.

There are several classrooms that have been reported to be cold and portable heaters have been brought as a supplement heating source. Duct mounted heaters should be added to the branch ducts serving these rooms instead of the portable heaters.

**b. Plumbing Systems and Fire Protection**

The present roof drainage appears to allow for some ponding in areas. In the well area of the roof there is construction debris that is causing water dams preventing the water from getting

to the drains. Some of the construction debris includes loose screws which can cause damage to the roof.

Most of the plumbing fixtures in the original portion of the building are generally in poor condition and should be replaced there are numerous urinals that have broken support tabs that are allowing them to be pulled from the walls. The fixtures also are not up to current standards for water consumption. Replacing them with new fixtures would greatly reduce the building water consumption.

There are two domestic water heaters that are beyond their useful life and should be replaced. Both of have a storage capacity of approximate 90 gallons and were manufactured in 1992 and 1997.

### **c. Fire Protection**

The building is only partly protected by a fire sprinkler system. A sprinkler system has only been installed in the new wing. The backflow preventor and main valve for this service are located in the crawl space under one of the classrooms. This makes access very difficult for inspection, testing, and maintenance. The location of the fire sprinkler devices has caused water issues in the past when leaks have occurred.

## **D. ELECTRICAL**

Electrical service to the building is rated at 1600A, 480/277V, 3-phase, 4-wires. The service rating appears to be adequate for the facility is adequate for the facility. Majority of the distribution system was upgraded and replaced in 1996-2000. Majority of the distribution equipment appears to be in good, working condition and no major deficiencies were observed. Considering average life expectancy of 30 years, most of the distribution equipment have remaining useful life expectancy of 8-10 years. However, it shall be noted that well maintained equipment can continue to provide reliable service well beyond their average useful life. Hence, it is highly recommended that a routine, preventive maintenance plan be put in place and implemented.

The building does not have an emergency generator. Hence, exit and emergency lighting to the facility is provided by emergency battery pack lighting units. Battery pack units and exit signs are being tested annually and appears to be in good working order. However, placement and quantity of the battery pack units appears to be inadequate to provide required minimum illumination level during power outage. It is recommended to perform a study of existing system in place and provide supplemental emergency lighting units to meet minimum means of egress light level requirements.

- Means of egress lighting in the building is provided by emergency battery pack lighting units. Based on the annual inspection and test label, units appear to be in working condition. Placement and quantity of the battery pack units appears to be inadequate to provide required minimum illumination level during power outage.

- Recessed panelboards installed in the hallways exceed maximum mounting height limitation of NFPA 70 for operating handle of the highest device (breaker) to be not more than 6'-7" above work platform or finished floor.
- It appears that a temporary power feed was installed for modular classrooms in the parking lot. The modular classrooms have been removed with associated feeder wiring removed back to the source disconnect switch in the main electrical room. However, the transformer serving the switch remains energized with live conductors to the line side of the disconnect switch. With no actual load supplied from the transformer, it is operating with no-load losses continuously on 24/7 basis wasting energy.
- The building uses fossil fuel burning equipment (boiler). However, required carbon monoxide detectors or alarms are not installed.
- Library does not have adequate fire alarm notification devices and emergency battery pack units.
- Cafeteria service counter have an open floor outlet. The outlet is missing cover plate exposing live conductors and creating life safety hazard.

## E. FIRE ALARM

The building's fire alarm and detection system is outdated and has served beyond its useful life expectancy of 15 years. Fire alarm system notification is by horn and bells only. The system is non-ADA compliant, and lacks required notification devices in the classrooms, except for the new wing added to the building (2005).

Fire alarm system notification is by horn and bells only, except for the new classroom wing, where visual notification strobes are provided in the hallways and classrooms.

Existing manual pull stations are mounted in corridors. The pull stations are located just above the glazed CMU, so they are not compliant with mounting heights required by NFPA 72 and ADA. Notification appliances are not located in classrooms and toilet rooms.

Locations of visible notification appliances in corridors are not in compliance with NFPA 72 and ADA.

Fire alarm pull stations mounting heights are not ADA compliant. The pull stations are mounted above 54-inch maximum height imitation to handle from finish floor level.

The building is not fully sprinklered. The sprinkler protection is provided in the new classroom wing only. The non-sprinklered portion of the building lacks required smoke detection throughout, except for those provided for activation of magnetic door hold release in the hallways.

We recommend replacing the entire facility fire alarm system with a new, addressable, fire detection and alarm system with ADA compliant visual notification strobes, and voice evacuation speaker system as required per current code.

Although the school has fuel-burning equipment and appliances, there are no carbon monoxide detectors in the school. The installation of carbon monoxide detection and warning equipment is a crucial life safety component. Carbon monoxide is a colorless, odorless toxic gas produced from incomplete combustion of

gas, oil, kerosene and wood. Excessive exposure to carbon monoxide may cause unconsciousness and death.

#### **F. STRUCTURAL**

Refer to Appendix C for detailed discussion on findings.

#### **G. CIVIL**

Under development.

## RECOMMENDATIONS

### A. ARCHITECTURAL

#### Priority 1:

- Single-ply membrane roofs have been undergoing replacements that have covered half the roof areas. The remaining areas still are vulnerable to leaks and require patching. In addition, mechanical penetration and duct insulation have been damaged, contributing to water infiltration issues. Completion of this work is currently ongoing and is important to the continued use of the building and will mitigate issues on the interiors.
  - Deficiency Category: Building Integrity
- There appear to be under-floor water issues in classroom 2. Given the nature of the building being built with a crawl space below, we don't think the water is coming from subsurface ground sources, but it may result from under-floor mechanical and plumbing systems failures. Combined efforts between architectural and mechanical systems must be deployed to remediate this issue.
  - Deficiency Category: Building Integrity, Environmental
- There are existing crawl spaces that had vents on the exterior walls and courtyards. Many of these have been covered, and we recommend removing covering and installing new grates. In addition, the introduction of fan ventilators may be needed to exhaust humidity from these spaces. There are some trusses under classroom 2 that need rust inhibitive paint.
  - Deficiency Category: Building Integrity
- Building requires elevator access to the second-floor classrooms. The second floor is non-ADA compliant. It is not shown on current budgets, but it was communicated that this is an active project pursuit and the team concurs it is a high priority.
  - Deficiency Category: Building code compliance, Accessibility code compliance, functionality
- Carpet replacement is needed due to carpets that are in poor condition.
  - Deficiency Category: Building Integrity, Appearance

#### Priority 2:

- The county currently has funds identified for 2020 for modernization of the cafeteria kitchen. This project is needed for functionality but not critical for immediate attention and the team concurs with its current 2020 action timeframe.
  - Deficiency Category: Functionality
- New Facilities: The county currently has funds identified for 2026 and 2017 for the design and then construction of a new facility to increase the capacity of the school by 22 classrooms to meet increasing demographic demands projected for that time frame. This is a critical item in this report as it may affect the priorities related to other investments that that will be overcome by the introduction of a wholly new building.
  - Deficiency Category: Building Integrity, Functionality
- The aluminum insulated windows are sweating and show thermal integrity failures that suggest a need for replacement. However, the county is currently doing select replacement of about 30 windows and replacing damaged sills as well as caulking around windows and sills.
  - Deficiency Category: Building Integrity, Energy

Priority 3:

- In the past, ACPS has identified asbestos tiles and mastic throughout the building. Therefore, it is recommended that the county continue to remediate these materials as they become exposed or are no longer entombed.
  - Deficiency Category: Environmental
- Leaks and water damage created stains in the ceilings and blemishes in the wall finishes. Though the source of the damage may have been controlled, the finishes need to be fixed.
  - Deficiency Category: Appearance
- Second floor bathrooms should be fully renovated. They are functional, but in poor condition, including difficult to operate doors.
  - Deficiency Category: Building Integrity, Appearance

Priority 4:

- The county currently has funds identified for 2020 for general site improvements that are not critical and are recommended for this priority level.
  - (1) repair the rusted and broken bench
  - (2) repair cracked and damaged basketball court surface to provide consistent surface for play and proper drainage
  - (3) provide proper barrier to prevent baseballs from hitting building and skylights
    - Deficiency Category: Functionality, appearance
- In addition to the select window replacements identified in Priority 2, if the building remains in use for long term, we recommend that all windows be replaced.
  - Deficiency Category: Building Integrity
- We recommend replacing the concrete backer board panels below the windows.
  - Deficiency Category: Building Integrity, Appearance
- Spot repair finishes in areas where leaks and water damage had created stains on the ceilings and blemishes on wall finishes. This will involve repainting interior walls and replacing existing ceilings in phase fashion.
  - Deficiency Category: Appearance
- Entry wall and similar exit walls comprise an aged construction system built prior to the current security and energy concerns. Also, they are poorly built and should be considered for replacement. Rebuild entry wall and exit window walls with commercial grade, aluminum-framed energy efficient curtain wall and associate doors. Use security glass as needed to protect areas against intrusion issues. If the building is slated for replacement, then this is an item that may not be done. However, if the building is to be expanded for the 22 class capacity increase, then this will be an important area to modernize for security and energy benefits.
  - Deficiency Category: Building Integrity, Appearance

## **B. MECHANICAL, PLUMBING AND FIRE PROTECTION**

Priority 1:

- All the exterior ducts should be reinsulated, and the condition of the ducts inspected when the existing insulation is removed.



- Deficiency Category: Energy, IAQ

Priority 2:

- Replace the existing rooftop packaged air conditioning units that are beyond their useful life.
  - Deficiency Category: Energy, Functionality
- Replace the two domestic water heaters that are beyond their useful life. Both have a storage capacity of approximate 90 gallons.
  - Deficiency Category: Energy, Functionality
- Provide a sprinkler system for the entire building. Currently, a sprinkler system is installed only in the new wing.
  - Deficiency Category: Life Safety Code Compliance

Priority 3:

- Replace the plumbing fixtures in the original portion of the building. Replacing them with new fixtures would greatly reduce the building water consumption.
  - Deficiency Category: Energy, Functionality
- Relocate the existing sprinkler system backflow preventor and main valve from the crawl space to a more accessible location. This will make it easier to access the equipment for inspection, testing, and maintenance. The current location of the fire sprinkler devices has caused water issues in the past because leaks have gone unnoticed for lengthy periods of time.
  - Deficiency Category: Functionality

## C. ELECTRICAL

Priority 1:

- Make safe existing floor mounted outlet at the cafeteria service counter by providing a cover plate.
  - Deficiency Category: Life Safety Code Compliance

Priority 2:

- It is recommended to perform a study of existing exit and emergency lighting system to further evaluate adequacy of the system and to provide supplemental emergency lighting units to meet minimum means of egress light level requirements.
  - Deficiency Category: Life Safety Code Compliance

Priority 3:

- Replace Panel 1-WW (200A, 120/208V, 3-ph, 4-wire) located in the hallway. The panel is obsolete, manufactured by Empire Switchboard Co., which is no longer in business and replacement parts and breakers are no longer available.
  - Deficiency Category: Functionality, Accessibility Code Compliance

Priority 4:

- De-energize the 75-kVA transformer to conserve energy.

- Deficiency Category: Energy
- Implement a routine preventive maintenance program which includes cleaning, visual inspection, mechanical and electrical testing of the equipment to ensure reliable continuity of the service.
- Deficiency Category: Functionality, Energy, Building Code Compliance

#### **D. FIRE ALARM**

##### Priority 1:

- Priority 1. Install carbon monoxide detectors in the fossil fuel burning equipment spaces and adjacent spaces as required per IFC 915.
  - Deficiency Category: Life Safety Code Compliance
- Install carbon monoxide detectors in classrooms in accordance with IFC 915.1.4. Carbon monoxide alarm signals shall be automatically transmitted to an on-site location that is staffed by school personnel.
  - Deficiency Category: Life Safety Code Compliance

##### Priority 4:

- Replace the entire facility fire alarm system with a new, addressable, fire detection and alarm system with ADA compliant visual notification strobes, and voice evacuation speaker system as required per current code.
  - Deficiency Category: Life Safety Code Compliance, Accessibility Code Compliance

#### **E. STRUCTURAL**

##### Priority 2:

- Repair the crawl space beneath Room 2 – STEM lab to eliminate humidity and prevent further rusting of the steel joists. The construction specifications should be reviewed to determine if a vapor barrier is required. If so, a vapor barrier should be installed to prevent further damage.
  - Deficiency Category: Building Integrity, Energy, Environment

#### **F. CIVIL**

Under development.



## SUPPLEMENTAL INFORMATION

### PHOTOGRAPHS



*Figure 8 and 2: Water ponding on the roof causing leaks*



*Figure 3: Joint repair needed*



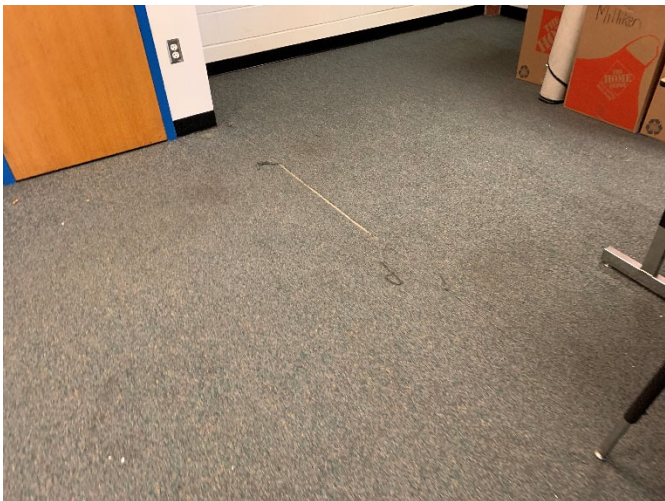
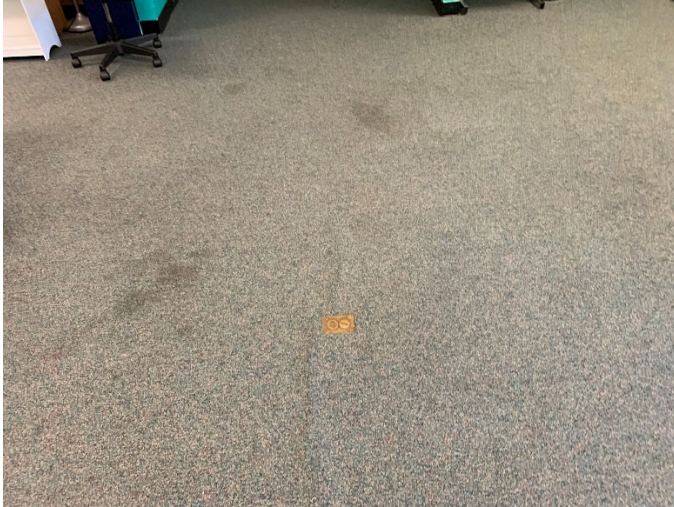


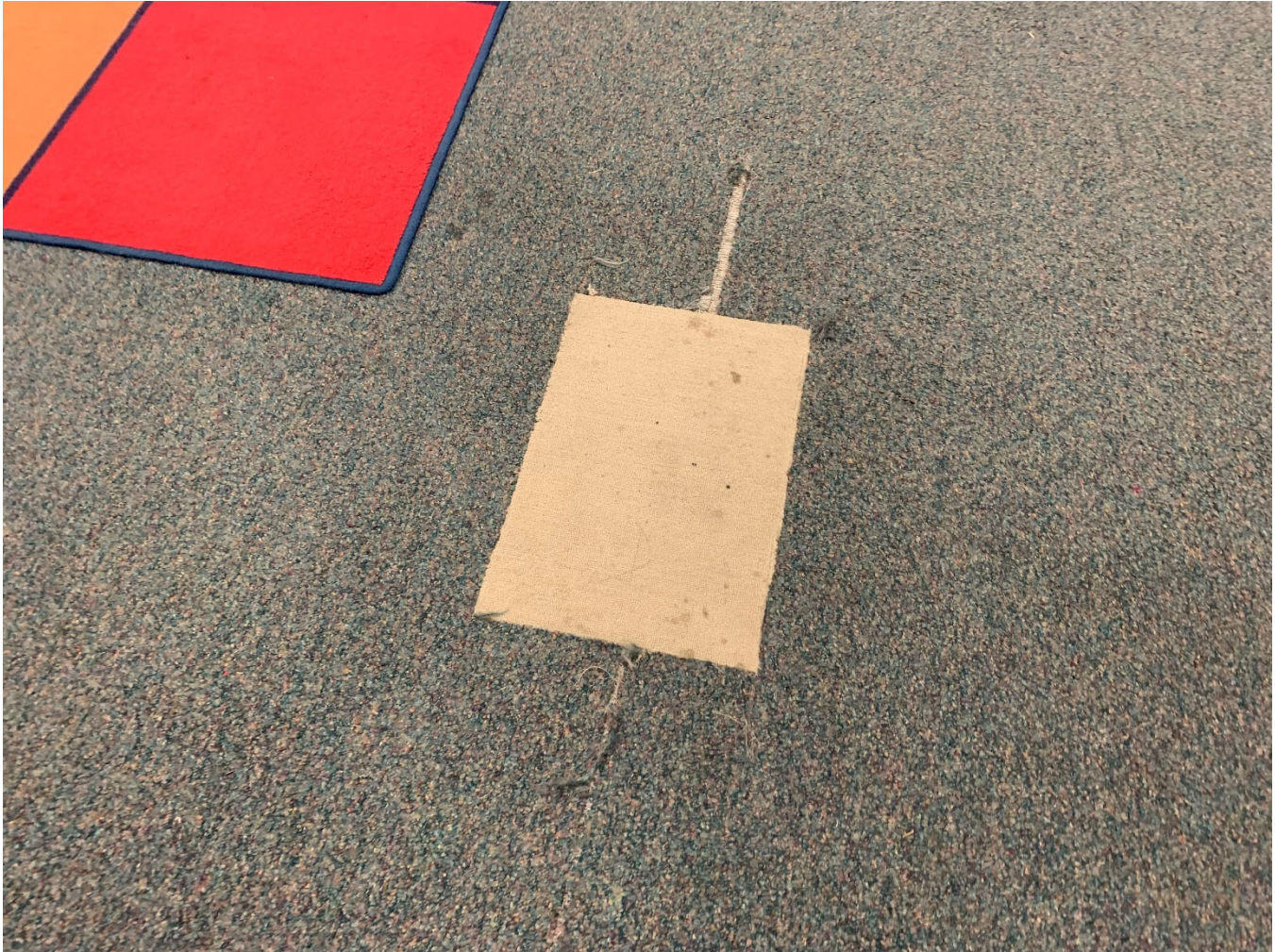
*Figure 4: Exterior ramp*



*Figure 5: Leaks and staining on ceiling tiles*







*Figure 6: Carpets need replacement*

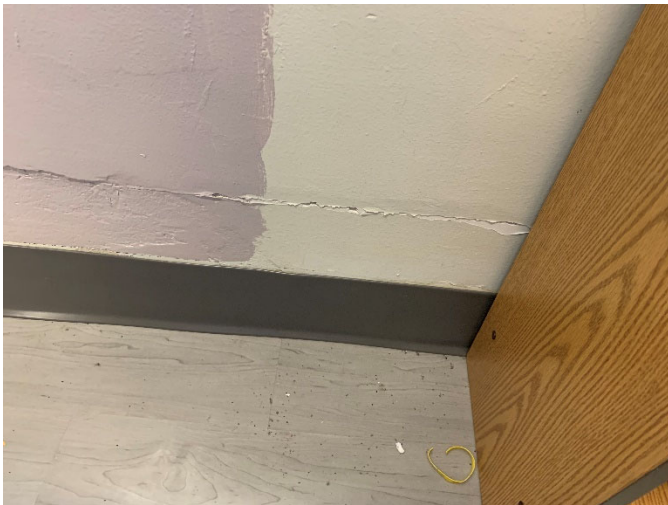




*Figure 7: Window Sweating*



*Figure 8: Paneling under the window pulling apart*









*Figure 9: Wall finish issues*



*Figure 10: Light dimmers required*



*Figure 9: Furniture laminates damaged*





*Figure 10: Fire Alarm Control Panels*



*Figure 11: Fire Alarm Pull Station / Horn / Bell – No Strobes or Emergency Battery Pack*



*Figure 12: Cafeteria Service Counter – Floor Outlet Missing Cover Plate*





*Figure 13: Obsolete Panel 1-WW*

## ARCHITECTURAL ROOM BY ROOM ANNOTATED SURVEY

Cora Kelly School  
 Architectural room by room annotated  
 survey 27-Jun-19

Room	Wall finishes failures (cracking, painting)	Wall paint failures	Door and window frames	Evidence of past leaks; ceiling stains	Acoustical ceiling panels	Carpet replacement/ floor tiles	Window sweating and seal failure	Cement backup board	LED lights/dimmers	Millwork laminate	No work required	Other comments
Office				1								
Principal's room				1	1							
Front entrance			1			1				1		
Boy's toilet	1											Urinal is missing; Door is broken.
Staff toilet												There is an access panel on the floor. Toilet is not ADA compliant.
Girl's toilet	1				1					1		
Lobby				1	1		1					Slab un-leveling at multiple joints. Might cause slab failure. No wheelchair access to the top floor. No sprinklers or detectors.
Staff room					1							
Library		1				1			1			Ramp is not ADA compliant. It's steeper than the norm and has a sudden landing.
Cafeteria							1					
Roof												Roof has water holdings
Staff lounge												Air circulation failure observed.
Gym	1				1	1						
1	1	1										
2		1		1	1	1						Crawl space might affect/eject the water from below
3		1										
4		1			1							
5								1				1 Need extra room for storage.
6								1				
7	1											Replace hooks used for hanging.
8												Bad lighting in the room.
9					1		1	1				
10	1	1			1	1	1					
11					1					1		Replace cork pin.
12	1									1		
13												1 Configuration in the bathroom is not ADA complaint. Rusted duct.
14	1			1								Air circulation failure observed, ADA toilet is being used as storage

15					1						Air circulation failure observed.
16	1				1						Air circulation failure observed.
17	1								1		Air circulation failure observed.
18										1	
19					1	1					Air circulation failure observed.
20					1	1	1				
21						1	1				Bugs and pest infestation.
22					1	1					
23									1		1
24						1					Air circulation failure observed.
25	1								1		

26	1						1					
27						1	1					
28	1			1						1		Need finishes, dimmers, new cabinet. Bathroom looks very old and worn.
29				1								Transparent acrylic on the door needs to be replaced. It's compromising visibility/privacy.
30						1		1				Toilet wall needs to be refinished.
31	1									1		
32	1						1					
33	1				1							Room temperatures are very extreme in this room.
34							1					
35	1	1		1								
36					1							
37											1	
38	1					1			1			
39						1			1			
40						1			1			
41						1			1			
42						1			1			
43	1					1			1			
44	1					1			1			Install a permanent wall or partition.
45	1	1				1			1			
46	1	1		1		1	1		1			
Total: 76	22	9	1	9	17	21	11	4	12	7	5	

## STRUCTURAL REPORT

**Albrecht Engineering, Inc.**  
3500 Boston Street Suite 329, MS-12 Baltimore, MD 21224  
Phone 410-522-5870 | Fax 443-927-7446



### Structural Facility Condition Assessment

**Date of Report:** 7/19/2019  
**Date on Site:** 7/17/2019  
**Attention:** Donald A. Silwick (Henry Adams, LLC)  
**Project #:** 2019-030  
**Project:** ACPS Henry Adams Assessments  
**Location:** Cora Kelly School of Math, Science and Technology  
3600 Commonwealth Avenue, Alexandria, VA 22305

### Concern:

Steel joists in the crawl space beneath Room 2 – STEM Lab, are rusting.



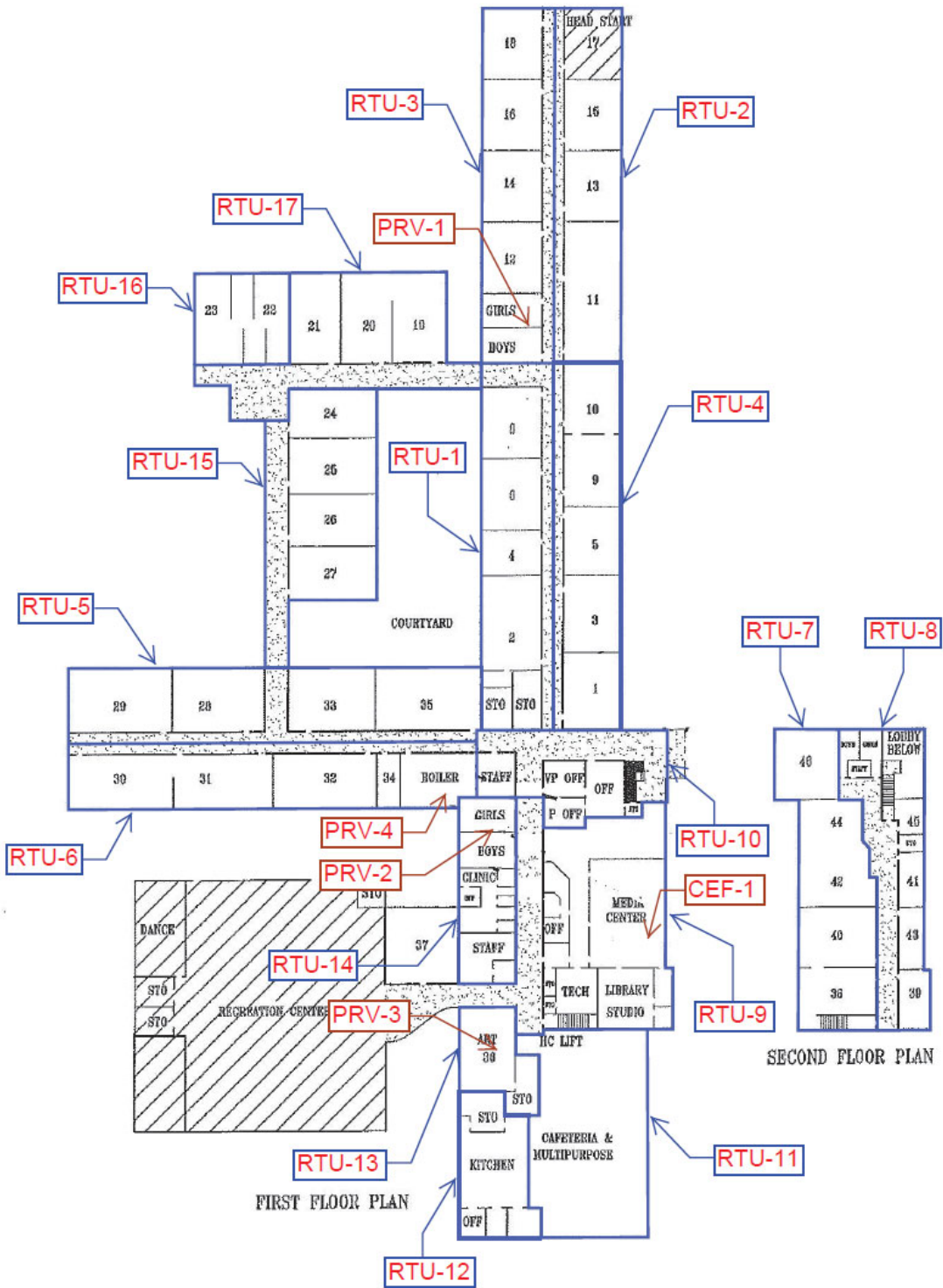
### Observations:

All the visible existing steel joists in the crawl space beneath the STEM lab are rusting, but there are no apparent signs of section loss. Measurements were taken at multiple locations on a badly rusted joist to determine if there were areas of significant material loss, there was not. The flange thickness was consistently 5mm +/- and the rod diameters were consistently 15mm+/-.

### Recommendations:

The crawl space will need to be repaired to eliminate the humidity and prevent further rusting. The construction specifications should be reviewed to determine if a vapor barrier is required – if so, a vapor barrier should be added to prevent further damage.

**FLOOR PLAN DIAGRAM**



**ALEXANDRIA CITY  
PUBLIC SCHOOLS**



ALEXANDRIA CITY PUBLIC SCHOOLS

FRANCIS C. HAMMOND MIDDLE SCHOOL



---

**A/E TEAM:**

**PRIME - HENRY ADAMS, LLC CONSULTING  
ENGINEERS**

**ARCHITECT - ECO-MAR, LLC**

**STRUCTURAL ENGINEER - ALBRECHT  
ENGINEERING, INC.**

**CIVIL ENGINEER - CLARK | AZAR &  
ASSOCIATES, INC.**

---

**Targeted Condition Assessment**

**DRAFT Final Report**

**August 9, 2019**

## GENERAL

### C. FACILITY DESCRIPTION

Henry Adams, LLC was tasked by the Alexandria City Public Schools System to conduct a physical survey to provide ACPS with a comprehensive study report documenting conditions and issues at the Francis C. Hammond Middle School.

Francis C. Hammond Middle School is a middle school on Seminary Road serving more than 1400 students. The building is a 2-story plus basement that is recorded as 236,125 gross square feet. The building is located on a 25-acre site that has a significant grade change of about 1.5 stories at the building and double that over the entire site. The main entrance to the building is on Seminary Road at the east side of the building with limited parking and roadways for drop-off on that side of the building. The largest percentage of parking is on the west end of the building adjacent to residential neighborhoods and accessible on grade at the basement entrance lobby to the main gymnasium. The building was originally constructed in 1956 as a four-year high school. A classroom cafeteria addition was built in 1959. The building was renovated in 2002, which included a large classroom addition for music and associated functions. The ball field to the south of the building was modernized in 2012. The building currently serves grades 6-8.

Building envelope and exterior walls: The envelope is predominantly brick veneer walls on concrete masonry back-up. Most of the fenestrations are exterior commercial-grade aluminum framed insulated windows. Given the ages of many of the portions of the building, it is not likely that a consistent level of insulation exists around the building, and it is equally likely that the details of the exterior walls vary. There are areas of curtain wall at the front entry, music room, library, and bridge connector. There have been four areas of concern regarding water intrusion, including at the roofs, windows, foundation walls, and crawl spaces adjacent to the foundation walls.

The surveys resulted in discovery of numerous issues and concerns contributing to unsatisfactory conditions within the building.

Remediation action associated with each of the deficiency are identified in SECTION III. RECOMMADATIONS.

### B. SUMMARY OF FINDINGS

The surveys resulted in discovery of numerous issues and concerns contributing to current or future conditions, which are leading to unsatisfactory conditions within the building. Refer to Section II. FINDINGS for detailed description of issued discovered. In summary, discovered issues included the following:

- The roofing over the D wing has had extensive failures, evidenced by the hundreds of spot patches on that roof. This has led to water intrusion events that have damaged finishes.
- B and E wings are currently undergoing a significant window replacement project that will alleviate thermal and moisture failures. It appears the scope of that project will include finishes work adjacent to the façade.



- The basement area in and around the cafeteria has been susceptible to ground water intrusion from a number of sources. Key areas of this problem are generated from the exterior wall around stair 9 as well as infiltration from the crawl space. This has created ongoing moisture issues with the finishes in the rear hall near stair 9, as well as around classroom 002.
- In the music wing, the potential of mold and roof water infiltration has been an ongoing issue with the auditorium. This also could have causal roots in the underperformance of the air-conditioning system and the lack of ample dehumidification. There has been past visible damage to the finishes and fixed seating. Full renovation of the interiors and finishes along with the HVAC system may be the only lasting solution for this area. In the meantime, we recommend quarterly air quality testing in this area.
- Roof drains are gathering in courtyards that, combined with the lack of good grading and overall storm drainage in these areas, creates a surcharge of subsurface water on adjacent basement areas.
- In the D wing, there are consistent cracks where the exterior masonry spandrel engages the perimeter column, suggesting there may be deflection, settlement, or rotation. These issues are being further reviewed by a structural engineer to determine whether the condition is problematic.
- On the western side of the building at the lowest level corridor to the boys' and girls' locker rooms, we observed a floor slab that is clearly failing. It was our understanding that this is a spanning slab over a crawl space and that it has been subject to regular flooding. This is a highly trafficked area. During the period when the building is unoccupied, the team is having a structural engineer review it to determine whether immediate action is required and provide recommendations accordingly. This is a potential safety concern and the team has communicated this to ACPS.
- In the gym at the high clerestory areas, there appears to be some separation between the column and outside wall. As the trusses are bearing on the outside wall and are possibly introducing some outward lateral forces as well as load bearing forces, we want to ensure the long-term integrity of that wall remains intact and safe. This issue will be further reviewed by a structural engineer.
- Leaks in the second-floor boys' room of D wing have brought down ceilings and created an unsafe condition that has left these rooms unoccupied for two years. While our report will address concerns with the roofing envelop failures, we believe that a structural engineer should also look at this area to be sure it has not degraded into a structurally unsafe condition.
- Room by room architectural assessments and finish notes are in the appendix.

### **C. REMEDIATION APPROACH**

- Engage a construction manager to perform these renovations over a multi-year period, including summer and other breaks.
- Reassess current budgets and priorities to align with critical spending and long-range best value investments.

### **D. COST**

Refer to APPENDIX XX for ROM estimate associated with each remediation project identified.

## FINDINGS

### H. ARCHITECTURAL

#### a. ROOFING

D wing roofing is a white, mechanically attached membrane and insulation low sloped roof. This is a white roof to reduce heat island effect. Although the roof appears to be more recently installed, there are hundreds of patches where leaks and other failures have occurred over this wing (Figure 1). The interiors of this wing have been damaged from these failures, including the second-floor boys' room that has been closed for two years (Figures 2 & 3). Based on the evidence, these roofs should be considered for full replacement.

#### b. EXTERIOR WALLS

Above ground, the exterior walls appear to be in good condition and were not associated with the current work of existing window and transom replacements. At the mono-directional roofs that drain with sheet flow toward a gutter, there is no overhang for the gutter, thus creating a situation where the overflowed gutters can wash their overflow across the façades (Figure 4). This can lead to water damage.

At the cafeteria areas around stair 9 (Figure 5), classroom 002 (Figure 6), and boiler room there have been chronic problems with ground water coming through the basement walls and creating flooding. The building engineer stated that there has been some limited damp-proofing and repairs, but the problem has persisted, suggesting that more significant waterproofing and sub-surface foundation drainage is needed.

At the basement locker room corridor, there has been chronic flooding from sub-surface water in the crawl spaces that build up in an uncontrolled fashion during heavy rain events. This translates to water penetrating through the basement wall and flooding occurring in this corridor (Figure 7). The slab at this corridor is failing. The area is under review by a structural engineer.

#### c. WINDOWS

B and E wings are currently undergoing a significant window replacement project (Figure 8) that will alleviate thermal and moisture failures. It appears that the scope of that project will include finishes work adjacent to the façade.

At the cafeteria there are two solarium dining areas. These have had interior design treatments

to reduce the solar heat gain. However, there is evidence of some failures in these window systems, such as window fogging and reports of water infiltration.

In the music room and room A108, there is some evidence of failures in the curved/segmented curtain wall façade. There are interiors where the finishes show water damage and penetration, and there are signs of fogged windows that are evidence of gasket failures in the glazing system.

**d. STORMWATER DRAINAGE**

Around the exterior of the building and in exterior walls adjacent to the crawl space, there is evidence of water infiltration due to uncontrolled subsurface water.

**e. INTERIOR REPAIRS**

On the western side of the building at the lowest level corridor to the boys' and girls' locker rooms, the team observed a floor slab that is clearly failing. It was our understanding that this is a spanning slab over a crawl space and that it has been subjected to regular flooding. It is possible there is no support for this slab, and the floor will eventually collapse. This is a highly trafficked area. While the building is unoccupied, the team is having a structural engineer review it to establish if immediate action is required and provide recommendations accordingly. This is a potential safety concern and the team has communicated this to ACPS.

Commonly throughout the building, there are areas where the exterior roof and window moisture intrusion problems have created damaged and stained finishes. Most of these are cosmetic in nature and would require minor patching, finishing, or replacement of ceiling tiles.

The most dramatic of these areas is in D wing. Roof and/or plumbing leaks above the second-floor boys' room brought down ceilings and created an unsafe condition that has left these rooms unoccupied for two years. The space is essentially condemned. Concern was raised by the building engineer that the problems could migrate to the ground floor. The team will have a structural engineer review this area to see if it has degraded into a structurally unsafe condition. The roof over this area needs to be replaced to ensure that leaks are not occurring. Above the ceiling, piping will need to be checked for leaks. In addition, the boys' room will need to be gutted and rebuilt in entirety.

**I. MECHANICAL, PLUMBING AND FIRE PROTECTION**

**a. HVAC**

One of the chilled water pumps in the mechanical penthouse room was repaired, but the insulation was not replaced. Since the pump is uninsulated, it is sweating and causing water to drip onto the ceiling in the room(s) below.

Most of the actuators for two-way control valves serving the heating water system do not work. This affects approximately 180 control valves. These valves are required to be open/closed manually due to the failure of the actuators. In addition, the main control valve for heating water which shuts down the heating water system is not working. This valve is supposed to be controlled by BAS but does not respond to BAS and must be operated manually.

AHU-4 has a broken return fan which is leading to dehumidification issues. The unit is aged as well and cannot meet the required cooling capacity and dehumidification needs of the spaces it serves.

AHU-5 serving the cafeteria is no longer functioning properly due to unit age and cannot meet the required cooling capacity and dehumidification needs of the spaces it serves.

AHU-2 serving the auxiliary gym is no longer functioning properly due to unit age and cannot meet the required cooling capacity and dehumidification needs of the spaces it serves.

RTU-12 and RTU-13 no longer functioning properly due to unit age and cannot meet the required cooling capacity and dehumidification needs of the spaces they serve. It was noted that these units shutdown frequently and need to be reset manually. It is expected that static pressure issues are present from the ductwork being undersized.

The split system units serving rooms 002 and 001 are constantly tripping and have required many manual resets.

RTU-5 had a noted freon leak which was to be inspected by Carrier. It is expected that Carrier will fix this issue since the unit has not yet reached end of life expectancy.

It was noted that RTU-18 and RTU-19 do not provide enough cooling for the spaces they serve when the spaces reach full or near full occupancy. It was noted that the supply fan for RTU-18 was damaged. This fan is being replaced.

The RTU serving rooms C110 through C119 was visibly surveyed to have significant air leakage at access doors to the unit. Existing seals at access doors and unit sections are aged and no longer functioning leading to large amounts of energy waste due to lost airflow.

It was described that RTU-16 previously had operation issues. However, the control board was replaced, and the unit appears to be currently functioning properly.

The unit heaters serving the gym and lobby stairwells are no longer secured properly and are falling off the wall.

AHU-9 has been known to trip often. This unit serves room A201 which has been noted to overheat often.

EF-4 serving the D hall has issues with the existing timer. The exhaust fan does not turn on/off properly based on the occupancy schedule.

The split system serving the kitchen offices is no longer functioning.

The condensing unit serving the split system for the elevator machine room near room 003 is disconnected and does not function. This leads to elevated room temperatures in the elevator machine room outside of the suggested room setpoint temperature range for the elevator machine room equipment.

**b. Fire Protection**

The building is fully sprinklered.

**J. ELECTRICAL**

The building is supplied with two electrical services: 1200A, 480/277V and 3000A, 120/208V. The combined service capacity at 8.7W/SF appears to be low, however there is no record of recurring power outages due to overload. Hence, service appears to be marginal, but adequate.

Much of the distribution system was upgraded in a 2002 renovation. There are, however, several branch circuit panelboards which were not upgraded or replaced and remain original to the building. Equipment replaced in 2002 have a remaining useful life expectancy of about 15 years. However, equipment original to the building is recommended to be replaced.

The building does not have an emergency generator. Hence, exit and emergency lighting to the facility is provided by emergency battery pack lighting units. Battery pack units and exit signs are being tested annually and appear to be in good working order. However, placement and quantity of the battery pack units appears to be inadequate in some areas to provide required minimum illumination level during a power outage. It is recommended to perform a study of the existing equipment in place and provide supplemental emergency lighting units to meet minimum means of egress light level requirements.

Means of egress lighting in the building is provided by emergency battery pack lighting units. Several recessed light fixtures also include integral emergency battery ballast. Based on the annual inspection and test label, battery pack lighting units and exit signs appear to be in working condition. Placement and quantity of the battery pack units appears to be inadequate to provide required minimum illumination level during power outage.

The emergency battery pack lighting unit just outside the Admin Office entrance is connected to the switched leg of the lighting circuit. This is a violation of NFPA 70. The emergency battery pack lighting unit is required to be connected to the unswitched hot leg of the local lighting branch circuit to provide charging voltage and sensing of normal power loss.

Several panelboards are original to the building and have far exceeded their useful life expectancy. These includes panelboards manufactured by Frank Adams, Federal Pacific, and Kinney.

- 200A, 120/208V, 3-ph, 4W Frank Adams panel located in hallway between Main Admin & Clinic.

- 100A, 120/208V, 3-ph, 4W Frank Adams panel located in Custodial Closet near Main Admin.
- 100A, 120/208V, 3-ph, 4W Federal Pacific panel in abandoned Dust Collector Rm.
- 200A, 120/208V, 3-ph, 4W Kinney panel located in hallway near Rm C120.
- 100A, 120/208V, 3-ph, 4W Frank Adams panel located in the Boiler Rm.
- (2) 100A, 120/208V, 3-ph, 4W Frank Adams panels located near Rm E111.

Electrical installation in the abandoned dust collector room is old, subject to deteriorating agents, has corroded, has open energized wiring, is unsafe in its current state, thus creating a life safety hazard.

The building uses fossil fuel burning equipment (boiler). However, required carbon monoxide detectors or alarms are not installed.

Electrical feed to condensing unit (S.S.I. #2) on the roof, serving elevator machine room EMR#1 has been cut and abandoned in place. As a result, EMR#1 does not have required HVAC.

Main electrical room housing 3000A, 208V service entrance switchboard and associated distribution panels is used as storage. Rollout tables are stored in front of the switchboard within electrical working space, rendering switchboard inaccessible. Utilizing the main electrical room as a storage area is a code violation. The National Electrical Code (NFPA-70) does not permit the main electrical room to be utilized as a storage area. In addition, code requires working clearances around the main switchboard, panelboards, and other electrical equipment must be maintained. The items being stored within the main electrical room shall be removed and stored elsewhere.

Panelboards in classrooms A201, C106 & C129 are obstructed by storage and are inaccessible. Electrical panelboards are required to have clear access and working space per NFPA 70. Storage within such workspace is a violation of NFPA 70. The items being stored within the electrical access and workspace shall be removed and stored elsewhere.

Cafeteria lighting was reported to stay on 24/7. Lighting control switches are provided for a very limited portion of the cafeteria. Lighting within the space shall be turned off when not occupied.

Lighting controls within the facility are by means of manual control toggle switches.

#### **K. FIRE ALARM**

The school's fire alarm and detection system was upgraded in 2006. The system is manufactured by Edwards Signal, Model EST2. The system is functional and is being tested annually as required. Based on a typical 15-year life expectancy, the system has a remaining useful life expectancy of two to four years. The system, however, lacks required voice evacuation notification, which is required by current building codes. Hence, it is recommended to replace the system in its entirety with a new, addressable, fire detection and alarm system with ADA and NFPA 72 compliant visual notification strobes, and voice evacuation speaker system.

There are several other deficiencies observed:

- Rooms E100A, E100B, E106, B221 do not have visual alarm strobes.



- Music Room – A104 do not have complete strobe coverage. Only one strobe device provided.
- Rooms D101, D102, D103, D104, D105, D112 are provided with multiple strobes, which is excessive.

Although the school has fuel-burning equipment and appliances, there are no carbon monoxide detectors in the school. The installation of carbon monoxide detection and warning equipment is a crucial life safety component. Carbon monoxide is a colorless, odorless toxic gas produced from incomplete combustion of gas, oil, kerosene and wood. Excessive exposure to carbon monoxide may cause unconsciousness and death.

#### **L. STRUCTURAL**

Refer to Appendix C for detailed discussion on findings.

#### **M. CIVIL**

Under development.

## RECOMMENDATIONS

### G. ARCHITECTURAL

#### Priority 1

- Replace D wing roofing with EPDM single-ply white membrane roofing system. This roofing area has had ongoing failures to the point of creating significant leaks that have damaged the interior space below. The ACPS needs to fully replace this roof before the interior environments can be fixed. Focus should be given on areas of the roof top equipment that are potentially creating failures due to vibration and traffic.
  - Deficiency Category: Building Integrity
- The damaged floor in the rear basement corridor is consistently flooding, and the slab is beginning to fail. We recommend reconstructing the basement floor slab and sub-structure in locker room corridor and providing additional floor drains and sump pumps.
  - Deficiency Category: Building Integrity
- Upon completion of or in conjunction with roof repairs, it is essential to the function of the school that the ACPS reconstruct the D wing second floor boys' and girls' rooms, which will include full partition, finishes (floor, wall, ceiling) plumbing fixtures drainage, ventilation, lighting, and electrical.
  - Deficiency Category: Building Integrity, function, building codes
- Complete window replacement (funded and in progress).
  - Deficiency Category: Building Integrity, energy
- Ongoing basement flooding in the new cafeteria is due to numerous issues, including lack of foundation waterproofing and drainage. We recommend excavating the length of the basement areas to the footing and install water proofing and French drain with relief. This will be around stair 9 and in portions of crawl space. In addition, there is a need sump pumps and drainage measures in these areas which should be designed with redundancy (like N+1).
  - Deficiency Category: Building Integrity, environmental
- The repair of leaking windows in the cafeteria (currently budgeted for 2020) should include the use of commercial storefront aluminum framed energy efficient windows.
  - Deficiency Category: Building Integrity, energy
- Due to ongoing complaints, evidence-based approaches are required for hazardous materials complaints. This team recommends that ACPS perform ongoing mold and ACM testing and mitigation of problem areas.
  - Deficiency Category: Environmental

#### Priority 2

- While the current need is to replace the D wing roof immediately, the school will need the aging roofs to be replaced throughout the roofscape. It is recommended that ACPS expand the replacement of roofs with an EPDM single-ply white membrane roofing system.
  - Deficiency Category: Building Integrity, energy
- Regrade courtyards. Create subsurface storm drain piping and connect to roof rain leaders. Install waterproofing and foundation drains at basement wall.
  - Deficiency Category: Building Integrity, environmental

- When the windows, roofing, and other environmental water infiltration problems have been dealt, we recommend lifecycle painting, including patch and refinish areas where needed and patch interior masonry wall cracks with flexible joint sealant and that painting be continued and completed.
  - Deficiency Category: Appearance

Priority 3

- Mold problems, roof leaks, and HVAC failures have plagued the auditorium space. Past problems with molding seats and unsafe indoor air quality have received the attention of the community. It is recommended that ACPS fully renovate the auditorium including, but not limited to, finishes, fixed seating, lighting, and HVAC systems.
  - Deficiency Category: Building Integrity, environmental, functionality, appearance.
- In addition to D wing and priority 2 areas, additional funding will be required to fully refresh the finishes in this building. This will mean additional funding and separate timelines for ceiling finishes replacement and wall painting in main wings. The project should also include full painting, flooring, and ceiling at locker room and basement fitness areas.
  - Deficiency Category: Building Integrity, energy

Priority 4

- Upgrade of existing tennis courts to a multi-use grid court is currently budgeted yet seen as a lower priority.
  - Deficiency Category: Building Integrity, function

**H. MECHANICAL, PLUMBING AND FIRE PROTECTION**

Priority 1

- Equipment and materials which have known failures should be replaced. The chilled water pump in the mechanical room which was repaired should have new insulation provided on it to prevent condensate formation and limit/eliminate energy waste. All two-way valves serving supply air terminal units for heating should be replaced. Controls contractor should reconnect the new control valves to the BAS and incorporate/ensure proper opening and closing from the BAS operator computer station. Split system units serving rooms 002, 001, kitchen offices and the elevator machine room should be replaced in kind. Exhaust fan EF-4 should be replaced and tied into the BAS for scheduled control/operation.
  - Deficiency Category: Energy, Functionality

Priority 2

- Replace the HVAC equipment that has reached or exceeded their expected useful life according to ASHRAE. According to information available this replacement has already been budgets in the years 2021 thru 2023. Calculations should be performed to determine appropriate cooling and ventilation to meet space needs and current code. Depending on the ventilation airflow, and supply airflow required, an energy recovery wheel may be necessary to meet current energy code. The new AHUs should be provided with chilled water cooling and hot water heating coils. These units should contain a relief fan, which will handle any exhaust requirements associated with the spaces served. The new AHU should be provided with new controls and tied into a building automation system (BAS) or can be a standalone controls system depending on owner preference. Structural modifications/reinforcement will likely need to be provided in order to mount the new unit on the roof. New valves and appurtenances should be provided at AHU coil connections. Ductwork should be modified/replaced in order to connect to the unit

supply/return/relief connections and connected to existing.

- Deficiency Category: Energy, Functionality

## I. ELECTRICAL

### Priority 1:

- Replace existing emergency battery pack lighting unit in the hallway outside the admin office and circuit it to the unswitched hot leg of the local lighting branch circuit to provide charging voltage and sensing of normal power loss as required per NFPA 70.
  - Deficiency Category: Life Safety Code Compliance
- In abandoned dust collector room, perform evaluation and identify existing electrical distribution equipment such as panelboard, disconnect switches, contactors, wire trough that is required to remain energized. Remove abandoned equipment and wiring. Replace equipment required to remain energized.
  - Deficiency Category: Life Safety Code Compliance, Building Code Compliance
- Remove stored materials such as rollout tables from 208V service main electrical room.
  - Deficiency Category: Life Safety Code Compliance
- Remove stored materials to provide access and code required working space for panelboards and electrical equipment throughout the facility.
  - Deficiency Category: Life Safety Code Compliance

### Priority 2:

- It is recommended to perform a study of existing exit and emergency lighting system to further evaluate adequacy of the system and to provide supplemental emergency lighting units to meet minimum means of egress light level requirements.
  - Deficiency Category: Life Safety Code Compliance
- Provide power wiring to roof top condensing unit S.S.I #2 serving EMR#1. Replace associated disconnect switch and wiring.
  - Deficiency Category: Functionality, Energy, Building Code Compliance

### Priority 3:

- Replace existing obsolete panelboards:
  - 200A, 120/208V, 3-ph, 4W Frank Adams panel located in hallway between main admin and clinic.
  - 100A, 120/208V, 3-ph, 4W Frank Adams panel located in custodial closet near main admin.
  - 100A, 120/208V, 3-ph, 4W Federal Pacific panel in abandoned dust collector room.
  - 200A, 120/208V, 3-ph, 4W Kinney panel located in hallway near room C120.
  - 100A, 120/208V, 3-ph, 4W Frank Adams panel located in the boiler room.
  - (2) 100A, 120/208V, 3-ph, 4W Frank Adams panels located near room E111.
    - Deficiency Category: Functionality, Accessibility Code Compliance
- Install occupancy-based lighting controls within cafeteria. Provide manual override key switches.
  - Deficiency Category: Functionality, Energy, Building Code Compliance

Priority 4:

- Implement a routine preventive maintenance program which includes cleaning, visual inspection, mechanical and electrical testing of the equipment to ensure reliable continuity of the service.
  - Deficiency Category: Functionality, Energy, Building Code Compliance
- Consider installation of occupancy-based lighting controls throughout the facility to conserve energy, and to comply with the applicable requirements of Energy Code IECC 2015.
  - Deficiency Category: Functionality, Energy, Building Code Compliance

**J. FIRE ALARM**

Priority 1:

- Priority 1. Install carbon monoxide detectors in the fossil fuel burning equipment spaces and adjacent spaces as required per IFC 915.
  - Deficiency Category: Life Safety Code Compliance
- Install carbon monoxide detectors in classrooms in accordance with IFC 915.1.4. Carbon monoxide alarm signals shall be automatically transmitted to an on-site location that is staffed by school personnel.
  - Deficiency Category: Life Safety Code Compliance

Priority 4:

- Replace the entire facility fire alarm system with a new, addressable, fire detection and alarm system with ADA compliant visual notification strobes, and voice evacuation speaker system as required per current code.
  - Deficiency Category: Life Safety Code Compliance, Accessibility Code Compliance

**K. STRUCTURAL**

Priority 1:

- Repair the roofing above D wing second floor bathroom, and repair failing angle braces.
  - Deficiency Category: Building Integrity
- Repair concrete slab in basement locker room corridor.
  - Deficiency Category: Building Integrity
- Fill vertical cracks at spandrels.
  - Deficiency Category: Building Integrity
- Fill cracks between gymnasium columns and walls and tie columns back to walls.
  - Deficiency Category: Building Integrity

**L. CIVIL**

**Under development.**





**SUPPLEMENTAL INFORMATION**

**PHOTOGRAPHS**

**Roof**



Figure 1. Roof – shown: D wing roof failures and patchwork

**D Wing**



Figure 2. Ceiling stains from roof failure

Figure 3. Condemned 2<sup>nd</sup> floor boys’ room

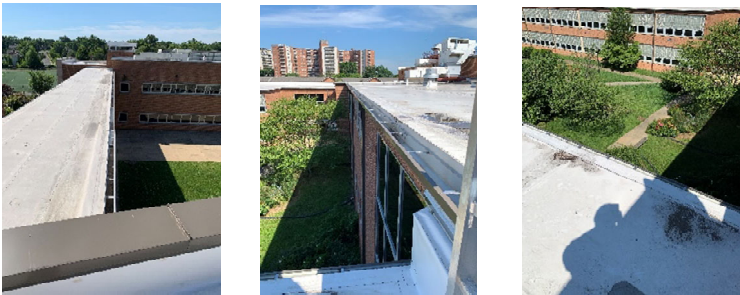


Figure 4. Mono-directional roof to gutter

**Ground Water Damage**



Figure 5. Cafeteria stairwell 9



Figure 6. Room 002

### Basement



Figure 7. Floor slab and sub-structure in locker room corridor



Figure 8. Window replacement (Left to right) E wing in progress and B wing soon to commence.  
**Classroom Samples**

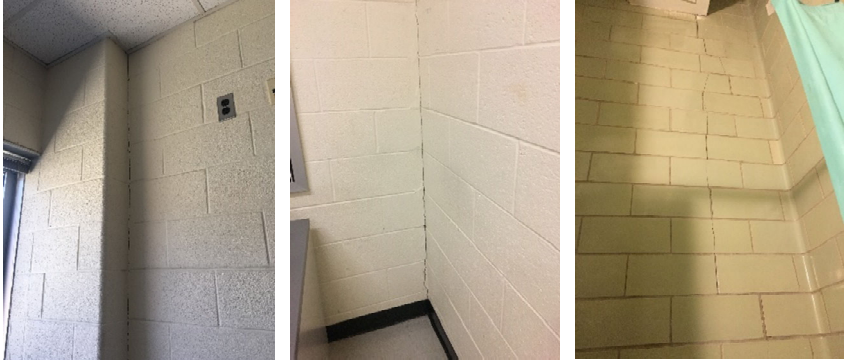


*Classroom flooring wear & rear – refer to matrix*



*Classroom wall finish issues – refer to matrix*

**Hallway & Classroom Samples**



*Interior masonry wall cracks – refer to matrix*





**AHU-2**



**OA-2**



**RTU-19**



**OA-1**



**EF-4**



**RTU-12**



**RTU-13**



**RTU-5, RTU-6**



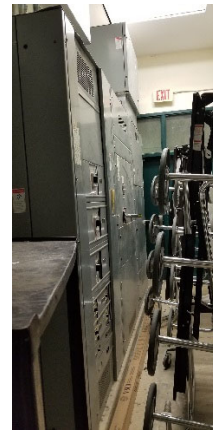
**RTU-18**



**FIRE ALARM CONTROL PANEL**



**DUST COLLECTOR ROOM**



**ELECTRICAL RM - STORAGE**

**ARCHITECTURAL ROOM BY ROOM ANNOTATED SURVEY**

Francis C. Hammond Middle School  
 Architectural room by room annotated survey  
 27-Jun-19

Room	Wall finishes failures	Flooring	Evidence of past leaks; ceiling stains	Wall paint failures	Carpet replacement	Minor finishes	Millwork laminate	No work required	Other comments
B211									WIP; hook by door
B208			1	1					
B209				1	1				WIP; cracked ceiling
B207	1								WIP; cracked ceiling; hook by door
B206 L									
B205				1	1				WIP; hook by door
B204				1	1				WIP; hook by door
B203	1			1					WIP
B202		1		1					WIP; water leakage from counter
B201B				1					WIP
B200B			1						WIP
B201A	1			1					WIP
B200A	1	1		1					
E210	1								door stop; mice
E213	1	1	1						
E211		1		1					foot mold
E209	1								foot mold
E208		1							WIP; foot mold
E207		1							level deflection on floor; window sweat
E206	1					1			WIP; foot mold; no threshold
E205					1				ceiling frame needs fixing
E204				1	1				hook by door
E203				1	1				
E202	1		1						light switch broken
E201			1		1				
E200				1					
A202 L									
A201									minor ceiling tile break
B231						1			window sweat; foot mold

B230					1		1	
B229			1	1			1	
B227		1	1					door hardware
B225		1						
B222	1	1	1		1			wear and tear issues; cracked ceiling
B223		1	1					light switch broken; hook by door
B221	1				1			wall bubbling
B216	1							room overcrowded
B219	1		1					humidity
B214	1		1		1			no threshold; strange new stain
B217							1	hook by door; minor ceiling crack
B212							1	minor ceiling wear and tear; humidity
B210		1			1			wet floor could be future issue
B215					1			
B213			1					mice evidence
D223 L								
D221							1	
D220 L								
D218 L								
D219			1					WIP?; storage in toilet; hook by door; rusting
D217	1	1			1			deep crack in corner
D216	1	1	1					ceiling stain looks fresh
D215 L								
D214	1		1		1			cracks in corner; foot molds
D212	1		1					hook by door; ceiling cracks; wall cracks
A204							1	
A206							1	Hollow raised floor
A200								water damage under window
D200			1					higher acheiver room?
D201			1					settlement cracks at wall; leak at corner
D202								ladder needs perforated tread
D203	1							exterior wall settlement crack
D204							1	
D205	1		1					leaks inside wall; wall corner cracks
D206			1					leaks inside wall
D207			1					leak inside wall
D208			1					leak inside corner
D209							1	
D210			1					minor leak damage
D211	1		1					minor leak; minor crack
D213			1					
	1		1					foot molds
	2	1						evidence of past water damage
E100	1		1		1			wall bubbling
E101	1				1			broken ceiling tile
E102	1	1			1			no threshold



E103		1		1				foot molds
E104				1	1			threshold
E106				1	1			threshold
E105		1		1			1	
E107				1	1			window sill damage
E108	1		1	1				no threshold
E109			1	1				no threshold; door swing
E110				1			1	
E112			1	1				
E111	1			1				foot molds; tile cracks
E114			1	1				foot molds; hook by door; ceiling holes
C98				1				no threshold
C99				1				WIP; ceilings have been dug out for pipes
C100	1		1	1				
C101				1	1			
C102				1			1	WIP; ceiling crack
C103				1	1			
C104	1			1				hook by door
C105				1	1			
C106			1	1				
C107			1	1				missing ceiling tile
C111				1				WIP; uneven ceiling and missing ceiling tile
C113				1			1	
C115				1			1	
C110				1				hole in ceiling; foot mold separation
C112			1	1				mice
C117				1				hole in ceiling; crack
C114	1			1				ceiling tile cracks and holes; broken light switch; humid
C119				1			1	
C116	1			1				foot molds under storage failing
C121	1		1	1				
C123			1	1				current moist ceiling tile
C118	1			1	1			
C125	1	1	1	1				ceiling holes
C120				1				ceiling holes
C127	1		1	1				
C122	1			1	1			no threshold
C129				1			1	
C131			1	1				
A109			1	1				stains from sprinkler head outside of room
A108				1			1	humidity
A106				1			1	
D101	1							minor cracks on exterior wall
D102							1	
D103	1		1					past moisture issues; crack on outside wall
D104			1					

D105	1		1						cracks on outside wall
D106	1		1						poor workmanship
D107	1		1						missing part of partition; crack at exterior wall
D108	1								crack at wall
D109	1								crack ot exterior wall
D110									crack at wall/spandrel
D111			1						crack at spandrel
D112									crack at spandrel
D114	1		1						cracks; leaks
D116									lots of spandrel cracks
D118			1						crooked column; cracks; leaks
Total: 102	44	17	49	64	18	2	3	16	

## STRUCTURAL REPORT

**Albrecht Engineering, Inc.**  
3500 Boston Street Suite 329, MS-12 Baltimore, MD 21224  
Phone 410-522-5870 | Fax 443-927-7446



### **Structural Facility Condition Assessment**

**Date of Report:** 7/19/2019  
**Date on Site:** 7/17/2019  
**Attention:** Donald A. Silwick (Henry Adams, LLC)  
**Project #:** 2019-030  
**Project:** ACPS Henry Adams Assessments  
**Location:** Francis C. Hammond Middle School  
4646 Seminary Road, Alexandria, VA 22304

---

### **Project Description**

Albrecht Engineering was retained to provide a structural facility condition assessment for the existing issues in the Francis C. Hammond Middle School building at 4646 Seminary Road, Alexandria, VA 22304. Our engineer conducted a walk-through survey of the building in order to determine the severity of the damage to the structural framing and recommend the appropriate course of action. The assessment included the evaluation of the steel framing above the boys' bathroom on the second floor, the concrete slab at the lower level corridor leading to the locker rooms, the cracks in spandrels in several areas, and the columns and walls in the gymnasium. Our engineer discussed historical repairs and renovations to the building with the building engineer and reviewed documents and information provided by ACPS. Albrecht Engineering developed opinions based on the information previously mentioned.

### **Existing Structural Framing**

Francis C. Hammond Middle School is a three-story building originally built in 1956. An addition to the original structure was added in 2002. The building is 236,125 square feet. The building has issues with water damage due to the recurring leaking of the roof and flooding of the lower level. Segments of the building have been out of order due to these issues.

**Assessment**

**Concern #1:**

Leaks in the second-floor bathroom of the D-Wing have brought down ceilings and left the bathroom unsafe and unable to be used.



**Observations:**

There is minor rusting of some of the steel framing above the bathroom. There are no apparent signs of section loss. Two of the brace angles are very rusted and seem to be failing at the welded joints where there is significant deflection.

**Recommendations:**

The roofing above this area should be repaired to stop the leaking and prevent further rusting of the framing. Also, the failing angle braces should be repaired or replaced to ensure they are performing at their full capacity.

Concern #2:

An area of the concrete slab at the lowest level corridor to the locker rooms is damaged.



Observations:

The concrete slab has some hairline cracking and is spalling in two concentrated areas. The slab appears to have been previously patched. Spalling areas are about 6"x2'-0"x1" deep.

Recommendations:

Remove spalled concrete and patch and repair as soon as possible to prevent further spalling. The crawl space beneath the area may require a new vapor barrier and drainage to prevent future flooding and damage to the slab.

Concern #3:

Various spandrels throughout the building have vertical cracks. Shown below are cracks in the spandrel of room D116.





Observations:

In room D116 (on the first floor) the CMU above the window has vertical cracks in several places. The exterior masonry shows no signs of cracking. There is no cracking elsewhere in room D116, only above the window. The cracks do not present a major concern. The location of the cracks suggests typical deflection and expansion.

Recommendations:

The cracks seem to be the result of the expected movement of the structure. Repair the cracks by filling them with a flexible material.

Concern #4:

In the gymnasium, columns appear to be separating from the walls.



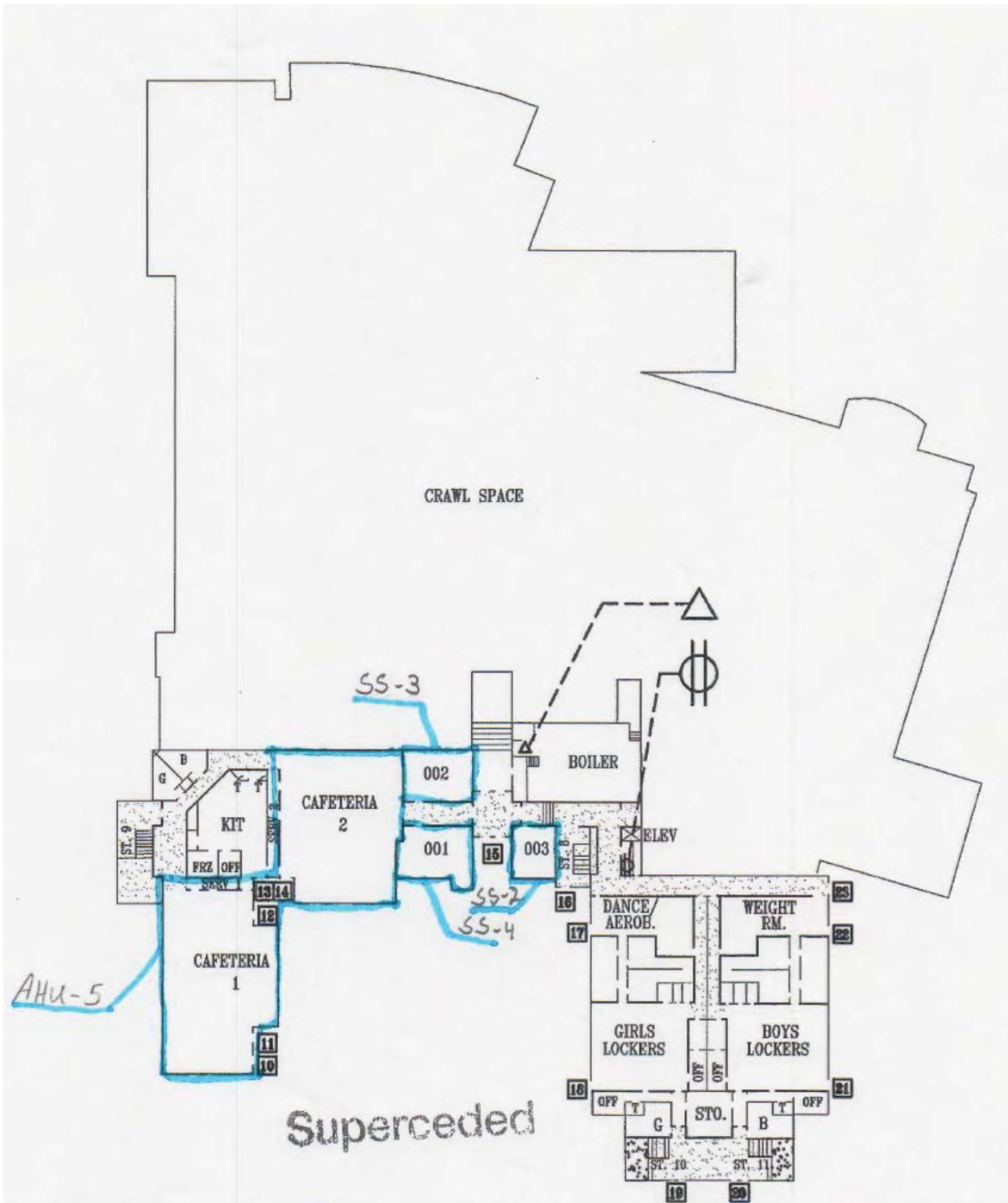
Observations:

At each of the four walls in the gymnasium, there are small cracks between the walls and the columns. The size of the cracks varies by column, but the widest crack measured was about 1/2". There also appears to be separation at the wall corners – one corner is separated along its entire length. These cracks do not present a major concern. The location of the cracks suggests that columns and walls are moving separately.

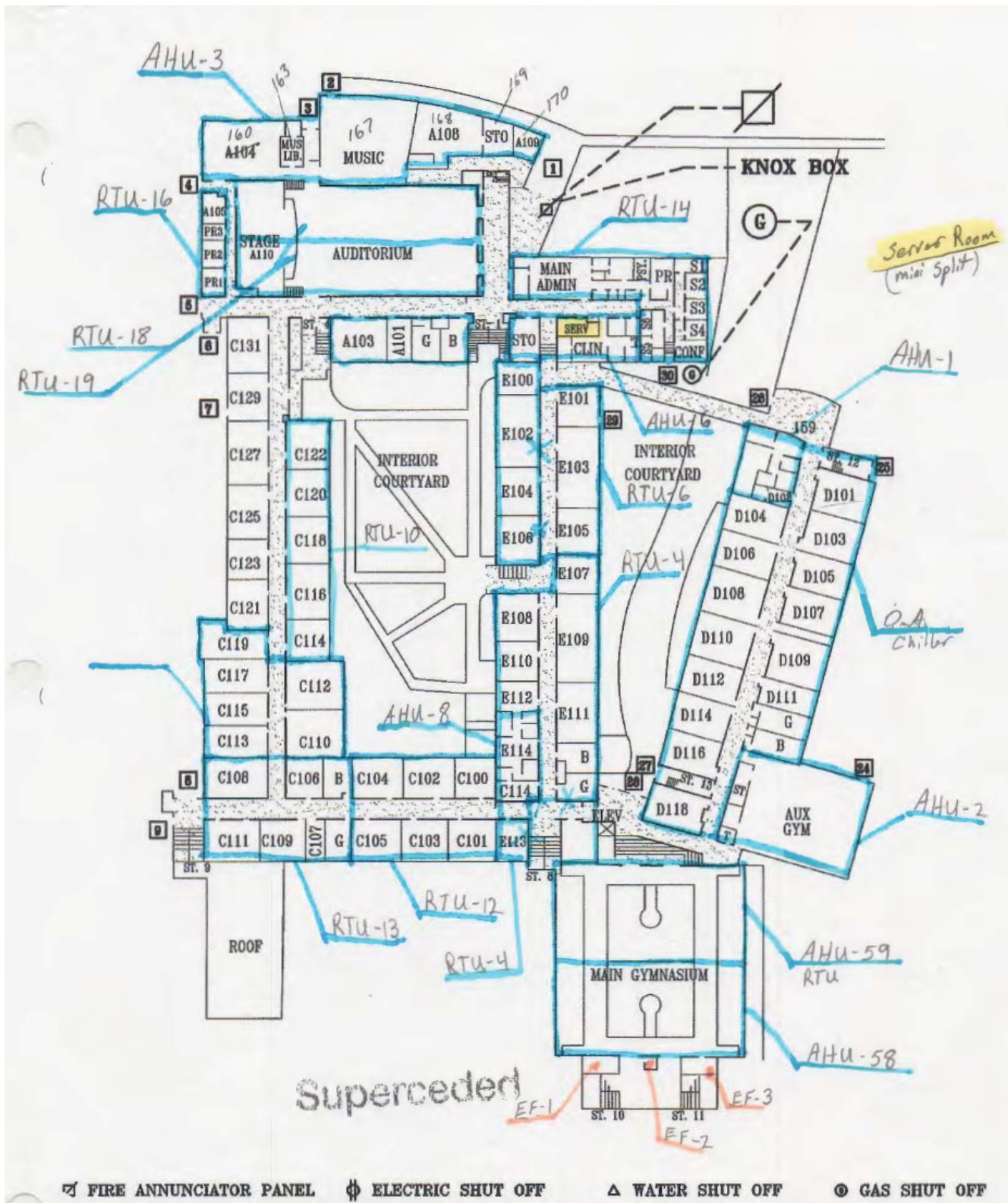
Recommendations:

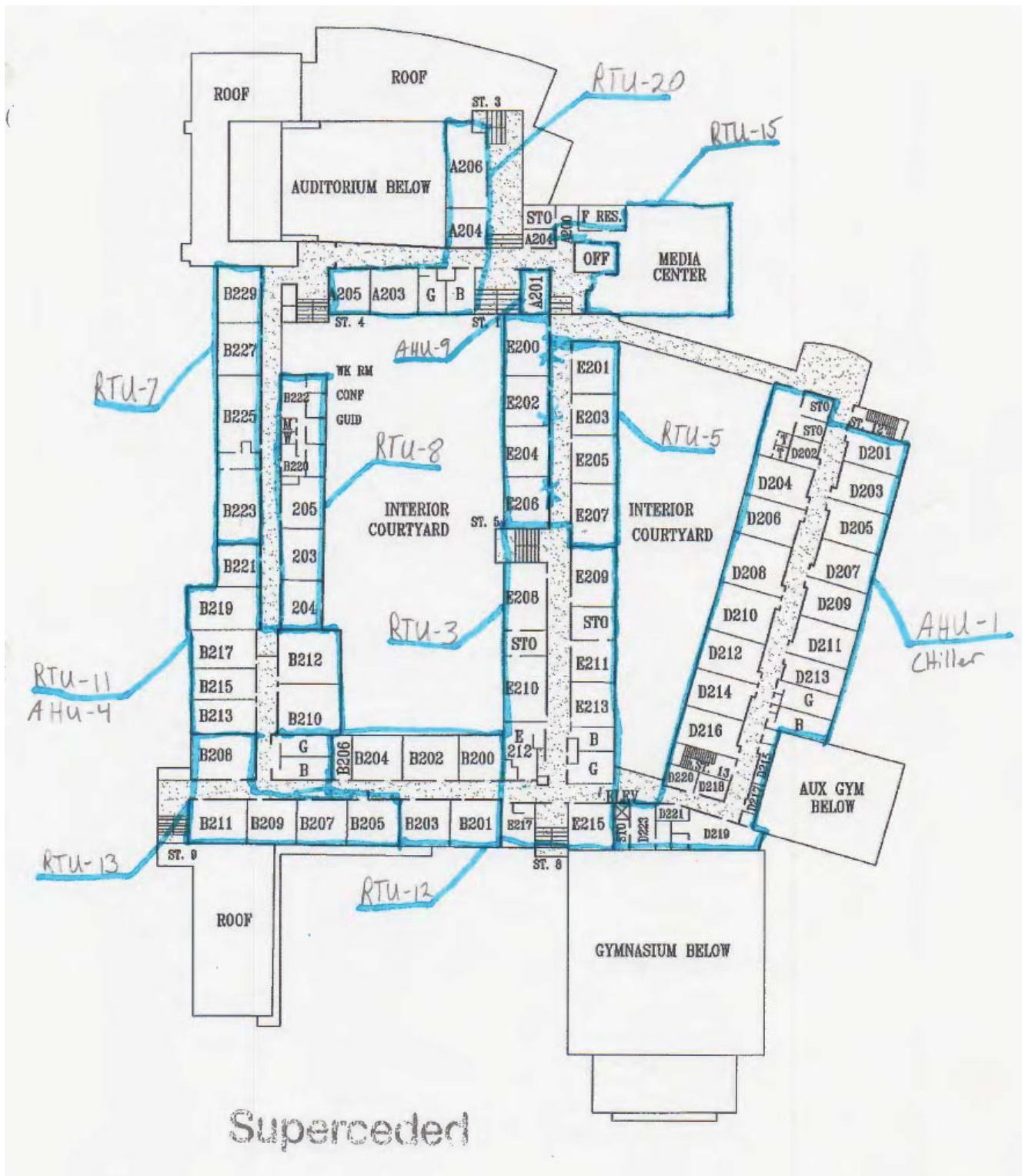
The cracks should be filled with a flexible material. The columns can also be tied back to the walls to prevent them from moving separately and cracking in the future.

FLOOR PLAN DIAGRAMS









**ALEXANDRIA CITY  
PUBLIC SCHOOLS**



ALEXANDRIA CITY PUBLIC SCHOOLS

GEORGE MASON ELEMENTARY SCHOOL



---

**A/E TEAM:**

**PRIME - HENRY ADAMS, LLC CONSULTING  
ENGINEERS**

**ARCHITECT - ECO-MAR, LLC**

**STRUCTURAL ENGINEER - ALBRECHT  
ENGINEERING, INC.**

**CIVIL ENGINEER - CLARK | AZAR &  
ASSOCIATES, INC.**

---

**Targeted Condition Assessment**

**DRAFT Final Report**

**August 9, 2019**

### D. FACILITY DESCRIPTION

Henry Adams, LLC was tasked by the Alexandria City Public Schools (ACPS) System to conduct a physical survey to provide ACPS with a comprehensive study report documenting conditions and issues at the George Mason Elementary School. It was communicated to the project team that this school is currently slated to be replaced in the early 2020s, however, some of the issues may need to be addressed prior to that work.

George Mason Elementary School is a 50,935-SF building comprised of buildings and additions from multiple eras. It was originally built during the Great Depression as a public works project. In 1949, a classroom wing was constructed; in 1961 a multipurpose room was added; and in 1977 additional classroom space was added. In 2015, the gymnasium and associated spaces were renovated along with an addition that placed a series of modular classrooms in the same area of the building.

The central building is a neo-colonial building constructed of brick masonry. Additions have endeavored to use some of the traditional neo-colonial details, but were stylistically designed in the keeping with their era.

The building's envelope is generally brick veneer on concrete masonry. Window systems vary, including classical wood double hung to aluminum framed commercial grade windows.

The surveys resulted in discovery of numerous issues and concerns contributing to unsatisfactory conditions within the building.

Remediation action associated with each of the deficiency are identified in SECTION III. RECOMMADATIONS.

### E. SUMMARY OF FINDINGS

The surveys resulted in discovery of numerous issues and concerns contributing to unsatisfactory conditions within the building. Refer to Section II. FINDINGS for detailed description of issues discovered. In summary, the following issues were discovered:

- Existing roofing with low slope single-ply TPO system has ponding and has been patched, yet it continues to be vulnerable to failure.
- The mansard slate roofs and built-in gutters and wood cornice have areas of water damaged wood members due to clogged rain leaders and overflowing gutters.
- Historic wood trims, cornices, and built-in gutters show signs of water damage, rot, and general neglect. These items need replacement and repainting.
- Historic double hung neo-colonial windows in classrooms have failing hardware and are inadequate from a thermal performance standpoint. The wood on these windows and frames has also degraded.
- Areas throughout the façade need brick pointing.
- In the classroom exits, there are rain leaders that need to be directed to underground drains that get the water away from the building.
- Interior closet doors are poorly set and installed and should be replaced.
- There is inadequate space in each classroom and inadequate storage for educational supplies.



- Library carpeting should be replaced.
- Past plumbing and roof leaks have left stained and damaged ceilings and walls.
- Toilet rooms are overdue for modernization.
- Past projects revealed asbestos under carpets.
- Flooding in basement mechanical/electrical rooms have resulted in a build-up of the potential for mold, which calls for regular indoor air quality testing as well as ongoing remediation.
- Water around the basement electrical equipment is a very dangerous issue. Where water cannot be prevented from infiltrating older building areas, there should be redundant sump pumps and drainage pipe infrastructure.
- The 1975 hydraulic elevator has reached the end of its usable life.
- The unit ventilators serving classrooms are old and past their useful life.
- There was some ponding of water noted on the roof and these areas should be addressed.
- The majority of the plumbing fixtures in the original portion of the building are operable but generally in poor condition and should be replaced.
- The sewage ejector pump system located in the basement has had several known issues and appears to be in poor condition.
- The building is not sprinklered.

#### **F. REMEDIATION APPROACH**

Engage a construction manager to develop and provide written detailed scopes, create budgets and multiple RFPs for staged modernization of the renovation recommended.

- Improve exterior envelope
  - TPO roof replacement
  - Mansard slate roof replacement
  - Window replacement
  - Gutter and downspout reconfiguration and reconstruction
  - Brick pointing
- Renovate interior
  - Ceilings
  - Paint walls
  - Closet doors
- Modernize toilet rooms

#### **G. COST**

Refer to APPENDIX XX for ROM estimate associated with each remediation project identified.

## FINDINGS

### N. ARCHITECTURAL

#### a. ROOFING

There are signs of leaks in the TPO roofing system evidenced by ceiling leaks throughout. The mansard tile and built-in cornice gutters have water damage due to continued build-up of debris. The roof appears to be beyond its intended life and is due for a renovation; this is evident from loose and broken tiles.

The gutter system of the original structure is a built-in gutter. The gutter is seated in a cornice that is wood framed and has painted wood trims.

#### b. EXTERIOR WALLS

Exterior brick walls have poor drainage (the bricks are moist/moldy). There are a few areas with settlement cracks.

#### c. WINDOWS

Most of the windows are historic wood double hung single pane windows. Many of the windows have broken hardware or are difficult to operate. They are beyond their useful life and should be replaced.

#### d. STORMWATER DRAINAGE

Related to the building roofing system storm drains is a combination of some internal and mostly external rain leaders. In the area ways at classroom 4 and classroom 3, the roof drains onto a landing and is not properly piped away from the building.

#### e. INTERIOR

General: The building was constructed in 1939 as a public works project. It has since been added to and renovated multiple times. As a result, wayfinding is poor, and many classrooms are undersized, other than the modular classroom by the gym.

Entry Vestibule: The entry vestibule is not ADA compliant, with a total depth of 5'-6" and lacks power assist door operators.

Classrooms:

- Interior wall finishes of classrooms are in poor condition with bubbling plaster and peeling/cracking paint. These issues are found in classrooms 4, 5, 9 and 19.
- Some of the older classrooms are considered too small for current class sizes.

Toilet Rooms: Boys' toilets have no stall doors for privacy. Both toilet rooms are aged and are due for modernization.

Finishes: Most of the interior finishes are significantly beyond their serviceable lives. In addition, moisture intrusion issues have left stains and blemishes on interior spaces. Many of the classrooms have mixed flooring materials. Carpeting has not weathered well. Eventually the school should consider using architectural vinyl or other quality resilient flooring systems. The library is a newer portion of the building, but the carpet is worn and will eventually need replacement.

Elevator: The elevator is 44 years old and due for a complete overhaul. Most controller parts and elevator machine parts are no longer available. Current elevator has frequent breakdowns and requires more service to keep it operational.

## **O. MECHANICAL, PLUMBING AND FIRE PROTECTION**

- The school is served by variety of mechanical HVAC systems. The majority of the classrooms are served by unit ventilators connected to a chiller/boiler system. The chiller is an air-cooled unit sitting in an enclosure on grade and was installed in the spring of 2019. There are two boilers in the boiler room that are gas fired pulse combustion boilers. The age of the boilers is unknown and they appear to be in good condition. The unit ventilators are old and past their useful lifecycles. They are mainly controlled individually by a toggle switch that has been installed on top of the units to turn the fan on and off. There does not appear to be any modulation of the chilled or heating water flow to the units. Gas fired rooftop units serve the gym and the core area of the building. These units are performing adequately. They were installed in 2003 and are at the end of their useful life. There is also a variable refrigerant flow system serving as infill in the addition and cafeteria. This system has been in service for around five years and is in good condition. There are also several split systems servicing office spaces, the first-floor teachers' area is served by one of these and there have been complaints of it not being able to maintain temperature. There is a conference room on the second level adjacent to the library that is mainly unusable due to the inability to maintain a comfortable environment in the space.
- In general, the roof drainage appears to be adequate and is predominately a roof drain interior piping system with some scuppers and overflows. There was some ponding of water noted and these areas should be addressed. Some of the overflows and roof drains discharge into downspouts with metal troughs located at a high elevation making it unnoticeable if the main roof drains are clogged and if rainwater is discharging through the overflow. There was some ponding of water noted and these areas should be addressed. These downspouts typically discharge at the right at the foundation wall and are not



directed away from the building.

- The majority of the plumbing fixtures in the original portion of the building are operable but generally in poor condition and should be replaced. The small child fixtures on the first level are no longer suited for the age of students they serve and should be replaced with new appropriately sized fixtures. The fixtures are also not up to current standards for water consumption. Replacing them with new fixtures would greatly reduce building water consumption.
- The two domestic water heaters that were manufactured in 2011 and 2017 and are in good condition.
- The building has a duplex sewage ejector pump system located in the basement. This system has had several known issues and appears to be in poor condition. During our visit to the site, one of the pumps had been removed for repair and the flange connection was left open. A makeshift trough was installed to divert any flow back to the tank through the opening left by the pump removal leaving the tank improperly sealed and allowing odors into the space.
- The building is not sprinklered.

## **P. ELECTRICAL**

### ***Normal Electrical Distribution System***

George Mason Elementary School is provided with a 2500-amp, 208Y/120-volt, three phase, four-wire service from Dominion Virginia Power (DVP). The service originates from a DVP pad-mounted transformer located outdoors in a fenced alcove north of room 10. Direct-buried service entrance conductors enter the basement electrical room through the north wall, and terminate on the main 2500-amp fused disconnect in the switchboard. The fused switch serves as the service entrance disconnect and the switchboard serves as the feeder distribution point for distribution panels, large mechanical equipment, and branch circuit panelboards throughout the school.

A report provided by ACPS from a 2015 condition assessment indicates that most of the electrical infrastructure was upgraded in 2003. The report indicates that the upgrade included the main switchboard and some of the electrical panelboards. While record drawings for the electrical upgrade project are not available, manufacturer's labels on the switchboard indicate that each section was manufactured in August of 2003, which confirms this time frame.

While new panelboards were installed throughout the facility under the 2003 electrical upgrade project, the project retained older panelboards and connected them to the new electrical distribution system. These older panelboards were installed during the original construction and are typically located in corridors. The panelboards are recessed in corridor walls above the glazed CMU. The height of the existing panelboards makes the circuit breakers difficult to reach without use of a step stool or ladder. The directories for these panelboards have not been kept current to accurately describe the loads served by each branch circuit. These panelboards are in poor condition and should be replaced.

During renovations to the boiler room, a wall was constructed that has rendered a branch circuit panelboard inaccessible. Tripped circuit breakers cannot be reset. This panelboard has basically been abandoned in place even though it still serves active branch circuits.

### ***Emergency/Standby Electrical Distribution System***

The emergency and standby electrical distribution system consists of a 150KW, 208Y/120 volt, 3-phase, 4-wire generator, an automatic transfer switch, and distribution circuit breaker panelboards.

The generator is housed in a weatherproof enclosure and is located adjacent to the utility company transformer in the fenced exterior alcove north of Room No. 10.

Feeders are routed from the generator to the automatic transfer switch in the basement electrical room.

## **Q. FIRE ALARM**

The existing fire alarm system consists two different fire alarm control panels: a conventional zoned system and an addressable system. The control panel for the addressable system is a FireLite MS-9200 control panel. The main office serves as the fire department entrance. The principal has indicated that the fire system was supposed to be replaced in 2014 and that the current system was only supposed to serve as a temporary fire alarm panel. The fire alarm system lacks voice evacuation notification, which is now required by code.

Existing manual pull stations are mounted in corridors. The pull stations are located just above the glazed CMU, so they are not compliant with NFPA 72 and ADA. Notification appliances are not located in classrooms and toilet rooms.

Locations of visible notification appliances in corridors are not in compliance with NFPA 72.

Although the school has fuel-burning equipment and appliances, there are no carbon monoxide detectors. The installation of carbon monoxide detection and warning equipment is a crucial life safety component. Carbon monoxide is a colorless, odorless toxic gas produced from incomplete combustion of gas, oil, kerosene, and wood. Excessive exposure to carbon monoxide may cause unconsciousness and death.

## **R. CIVIL**

Under development.

## RECOMMENDATIONS

### M. ARCHITECTURAL

#### Priority 1

- The current facilities are functionally undersized and outdated. The population projections show increases in areas that drive projections for more space to handle a growing student body. The county has planned for design and construction (renovation and expansion or new building) of a larger, new school to accommodate a 700-student capacity (currently budgeted and planned for design in 2023 and construction in 2024). This would need to be considered as a value measure regarding lower priority long-term renovations of the existing facility.
  - Deficiency Category: Building Integrity, Functionality
- The existing roofs have leaks and a variety of issues related to an aging roof system pushing beyond useful life. Especially in slate mansard roof assemblies, there are visible signs of age and failing roof gutters that have led to wall and interior water infiltration damage from uncontrolled gutter overflow. The roof areas are approximately 38,000 SF.
  - This study recommends that ACPS replace existing roofing with low slop single-ply TPO system on rigid insulation for all low sloping roofs. This will include the phased removal and replacement of roofs. Work includes removal, repairs, installing insulation, membrane roof, curbs, boots and sleeves, cants, parapet flashing, walking pads, ladders, and comprehensive roof drainage and overflow.
    - Deficiency Category: Building Integrity
  - For the mansard slate roofs, it is recommended that ACPS replace the system with new slate or faux slate system. This will include repair of damaged sub-straight and roof framing, installation of roofing felts, flashing, venting, and slate tiles. In addition, ACPS will need to rebuild built-in gutters and wood cornice. Replace water damaged wood members and sheeting as needed. A regular program of maintenance of gutter and downspout debris will be needed.
    - Deficiency Category: Building Integrity
- Because the buildings have experienced regular water infiltration issues, we recommend ACPS perform quarterly air quality testing for mold in the basement and other sample areas in the building.
  - Deficiency Category: Environmental
- To offset the continued flooding and other water infiltration issues, we suggest a combination of waterproofing and foundation drain at outside wall of basement electrical/mechanical room and installation of redundant sump-pumps and drainage pipe infrastructure for basement. Mechanical/Electrical rooms. Modify roof leader stormwater drainage piping to avoid water build-up against exterior walls.
  - Deficiency Category: Building Integrity, Environmental

#### Priority 2

- Upon completion of roof and drainage issues, there will be a need to address walls that have been weathered. It is recommended that ACPS perform targeted brick pointing.
  - Deficiency Category: Building Integrity

- Closed doors throughout the classrooms are in poor shape as a result of quick fix projects and heavy use. We recommend the replacement closet doors throughout the classrooms.
  - Deficiency Category: Building Integrity, Functionality, Appearance
- The elevator is 44 years old and due for a complete overhaul. Most controller-parts and elevator machine parts are no longer available. Current elevator has frequent breakdowns and requires more service to keep it operational. We recommend ACPS replace the elevator.
  - Deficiency Category: Building Integrity, Functionality, Building Code Compliance, Accessibility Code Compliance

### Priority 3

- The current historically designed double-hung wood windows are in deteriorating condition. Should the ACPS not move forward with a building replacement project, these windows will have to be replaced with new commercial grade, energy efficient aluminum windows, custom detailed to fit in the historic architecture of the various-aged building.
  - Deficiency Category: Building Integrity, Energy
- If the building will remain in occupancy for a long period, then the entry vestibule interior will need to be renovated for security and ADA compliance.
  - Deficiency Category: Accessibility, Code Compliance
- As the building’s envelope and water infiltration issues are mitigated, then the opportunity to replace finishes comes into play. Spot repair painted walls and replace acoustic lay-in ceilings where leaks and water intrusion have created damage.
  - Deficiency Category: Building Integrity, Appearance
- Replace existing mixed material flooring with a high-grade architectural vinyl flooring.
  - Deficiency Category: Building Integrity, Appearance
- Spot patch (including control joints) finishes at settlement cracks between different buildings.
  - Deficiency Category: Building Integrity, Appearance
- Throughout the facility, single and gang toilet rooms are aged and require comprehensive modernization. While they are still functional, the condition is generally below standard, including air quality, lighting, and finishes. If the current buildings are intended to remain in operation for many more year, then it is important to modernize toilet rooms.
  - Deficiency Category: Building Integrity, Functionality, Building Code Compliance, Environmental, Appearance
- Mitigate asbestos under carpets and provide new carpet.
  - Deficiency Category: Environmental

### Priority 4

- The library carpeting is worn, and we recommend that ACPS replace library carpeting.
  - Deficiency Category: Appearance

## **N. MECHANICAL, PLUMBING AND FIRE PROTECTION**

### Priority 1

- Replace the existing duplex sewage ejector pump system.
  - Deficiency Category: Environmental, Functionality, Environmental

### Priority 2

- Redirect roof drainage away from building towards stormwater intakes.
  - Deficiency Category: Building Integrity
- Completely replace aging and multisystem HVAC with modern system such as variable refrigerant flow system.
  - Deficiency Category: Energy, Functionality

## **O. ELECTRICAL**

### Priority 2:

- Install new panelboard in boiler room to replace existing panelboard that has been rendered inaccessible by the boiler room wall that has sealed the panelboard door.
  - Deficiency Category: Functionality, Building Code Compliance

### Priority 3:

- Replace old panelboards that were installed at the time of original building construction.
  - Deficiency Category: Functionality, Accessibility Code Compliance

### Priority 4:

- Implement a routine preventive maintenance program which includes cleaning, visual inspection, mechanical and electrical testing of the equipment to ensure reliable continuity of the service.
  - Deficiency Category: Functionality, Energy, Building Code Compliance

## **P. FIRE ALARM**

### Priority 1:

- Install carbon monoxide detectors in the fossil fuel burning equipment spaces and adjacent spaces as required per IFC 915.
  - Deficiency Category: Life Safety Code Compliance
- Install carbon monoxide detectors in classrooms in accordance with IFC 915.1.4. Carbon monoxide alarm signals shall be automatically transmitted to an on-site location that is staffed by school personnel.
  - Deficiency Category: Life Safety Code Compliance

### Priority 2:

- Install smoke detectors in north and south attic storage rooms.
  - Deficiency Category: Life Safety Code Compliance

### Priority 4:

- Replace the entire facility fire alarm system with a new, addressable, fire detection and alarm system with ADA compliant visual notification strobes, and voice evacuation speaker system as required per current code.
  - Deficiency Category: Life Safety Code Compliance, Accessibility Code Compliance

## **Q. CIVIL**

Under development.



**SUPPLEMENTAL INFORMATION**

**PHOTOGRAPHS**



**Figure 14 Roof Failures**



**Figure 15 Exterior Wall Moisture and Settlement Cracks**



Figure 16 Inoperable Window Hardware



Figure 17 Inadequate Stormwater Drainage

**Classroom Samples**



Figure 18 Wall Finishes



Figure 19 Low Closet and Door Hooks



Figure 20 Ceiling Stains





Figure 8 No Stall Doors



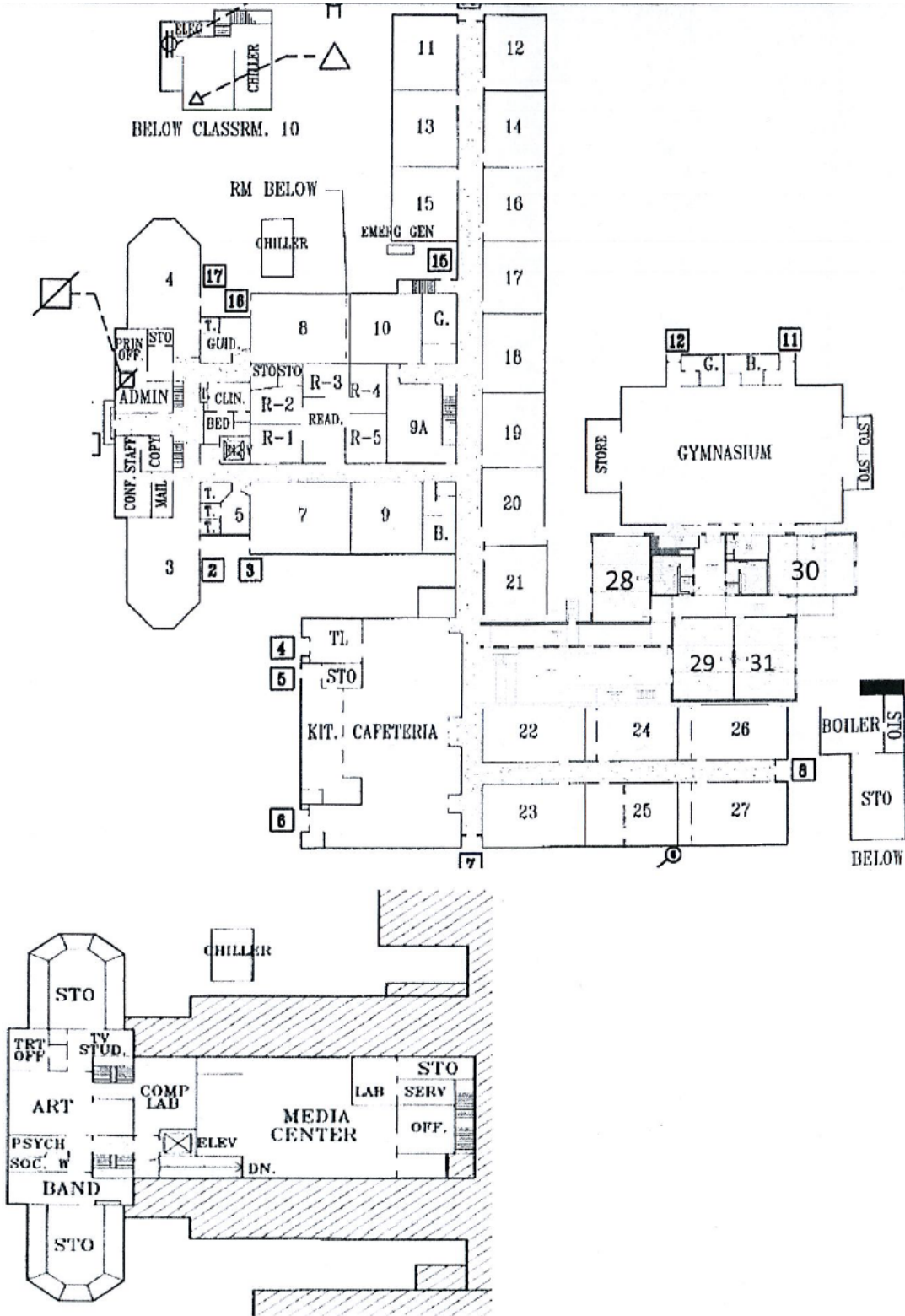
Figure 9 Settlement Crack (seen in Library)

ARCHITECTURAL ROOM BY ROOM ANNOTATED SURVEY

George Mason School  
 Architectural room by room annotated  
 survey 27-Jun-19

Room	Wall finishes failures (cracking, painting)	Carpet replacement/ floor tiles	Evidence of past leaks; ceiling stains	Wall paint failures	No work required	Other comments
RM 1					1	
RM 2					1	dingy lighting
RM 4		1	1			weird smell; door holding system
RM 5			1			stuffy air; no windows; hook by door
RM 7	1			1		window hardware; bad smell
RM 9			1			closet hook; potential insulated pipe issue
RM 9a						no fire protection; hook by door; non ADA compliant exit 25"
RM 10						hook by door; needs sound-proofing; no storage; water issues near green roof
RM 19			1			closet hooks are low; no courtyard lighting; needs daylighting
RM 28						ceiling tile crack; no storage; thumb bolt not permitted
MUSIC RM						outside needs draining system; needs bathroom stalls/doors;
TOTAL	1	1	4	1		

FLOOR PLAN DIAGRAM







**ALEXANDRIA CITY  
PUBLIC SCHOOLS**



ALEXANDRIA CITY PUBLIC SCHOOLS

GEORGE WASHINGTON MIDDLE SCHOOL



---

**A/E TEAM:**

**PRIME - HENRY ADAMS, LLC CONSULTING  
ENGINEERS**

**ARCHITECT - ECO-MAR, LLC**

**STRUCTURAL ENGINEER - ALBRECHT  
ENGINEERING, INC.**

**CIVIL ENGINEER - CLARK | AZAR &  
ASSOCIATES, INC.**

---

**Targeted Condition Assessment**

**DRAFT Final Report**

**August 9, 2019**

## GENERAL

### E. FACILITY DESCRIPTION

Henry Adams, LLC was tasked by the Alexandria City Public Schools (ACPS) System to conduct a physical survey to provide a comprehensive study report documenting conditions and issues at the George Washington Middle School.

George Washington Middle School is a 2- and 3-story, 237,332-SF masonry building comprised of several older structures and additions. There is a census of 1,392 students in grades 6-8 (as of 9/5/2017). The school was built in 1935 and operated as a high school at that point in time. The school was reorganized in 1971 to serve grades 9 and 10. The school was reorganized again in 1979 to serve 7th, 8th and 9th graders. The school was finally converted to a middle school in 1993.

The building is split into four separate sections: A, B, C and D. Section A was part of the original construction and houses classrooms, courtyards, the cafeteria, and auditorium. The building's envelope in Section A is comprised of brick on concrete block with a mixture of plaster and furred gypsum interior faces of wall. Newer additions have been constructed in Section A for the expansion of the cafeteria and were of like materials. The historic windows in this section of the building are predominantly single pane wood double hung windows. The roof is a single-ply TPO membrane roof replaced in 2017. The building is served by two hydraulic elevators were installed in 1988 and 2003 and were modernized in 2016. Section B, the library and entry, was part of the comprehensive building additions that interconnected older structures in 2003. This is a mixture of masonry veneer on concrete block backup with interior gypsum finishes, and aluminum framed curtain walls and commercial grade aluminum windows. This area has an older single-ply TPO membrane roof that is scheduled for replacement. Section C was also part of the interconnecting additions. It is a two-story classroom addition linked to older one-story pavilion structures. The older structures were 1930s era brick and block masonry exterior walls and concrete structural frame. The new building is a steel framed structure with a mixture of CMU and brick cavity wall construction and curtain walls. All the interior areas were modernized in 2003. Section D is composed of the 2003 link and interior modernization and the renovated 1961 gymnasium building. This section houses the gym, locker rooms, exercise rooms, dance room, weight room, and music rooms.

Water damage, air quality, potential mold, humidity control, and lingering ACM problems will require the ongoing attention of ACPS for continued modernization of this building. Water intrusion issues were seen throughout the basement areas. Water intrusion issues were seen on the westerly side of Section A. This appears to be from exterior wind pressure encouraging moisture migration through that area of the exterior envelope. Humidity and HVAC system-related moisture have also created issues in areas like the music rooms and multiple classrooms. The six classrooms under the auditorium adjacent to the cafeteria are underserved by the HVAC system and will need modernization. The sub basements in Section A have also experienced ground water intrusion and flooding. Other moisture and water intrusion currently affecting the interior appear to be due to uninsulated HVAC piping sweating. There are multiple rooms identified in the room-by-room matrix where finishes should be patched and repainted to remediate past issues.

Remediation action associated with each of the deficiency are identified in SECTION III. RECOMMADATIONS.

## H. SUMMARY OF FINDINGS

The surveys resulted in discovery of several issues and concerns which are leading to unsatisfactory conditions within the building. Refer to Section II. FINDINGS for detailed description of issues discovered. In summary, the issues discovered include the following:

- Section A windows should be replaced with custom, commercial grade insulated windows to match existing profile and design. Water intrusion issues were seen on the westerly side of Section A.
- Water intrusion issues were seen throughout the basement areas.
- Humidity and HVAC system-related moisture have also created issues in areas like the music rooms and multiple classrooms.
- The six classrooms under the auditorium adjacent to the cafeteria are underserved by the HVAC system and will need modernization.
- Water drainage and through-wall infiltration may be caused by the courtyards where roof drains are gathering.
- Uninsulated HVAC piping has had sweating and leaking issues that have created moisture related finishes damage.
- There is ground water intrusion in basement areas of Section A due to failure of the sump pump. There is no feasible method for water-proofing these walls, so any mitigation should be focused on water removal.
- Elevators appear to be in good working condition.

I.

## J. REMEDIATION APPROACH

Working with a construction manager, create budgets and multiple RFPs for staged modernization of the renovation recommended.

Remediation action associated with each of the deficiency are identified in SECTION III. RECOMMADATIONS.

## K. COST

Refer to APPENDIX XX for ROM estimate associated with each remediation project identified.

## FINDINGS

### S. ARCHITECTURAL

#### a. ROOFING

Roofing is generally new over Sections A, C, and D. It is our understanding that Section D roofing is forthcoming, budgeted, and planned.

#### b. EXTERIOR WALLS

- There is evidence of birds or mice removing mortar on both interior and exterior. Pest control and minor O+M patching is required.
- Evident wood rot in the moldings from moisture, which should be replaced in-kind when wall and floor finishes are done.
- Brick is weathering at corners and repointing is required.
- Water intrusion issues were seen throughout the basement areas.
- Water drainage and through-wall infiltration may be caused by the courtyards where roof drains are gathering.

#### c. WINDOWS

- Section A needs replacement of historic windows damaged by moisture issues with custom windows, with priority placed on westerly side.

#### d. STORMWATER DRAINAGE

Ground water intrusion in basement areas will need to be mitigated by water removal such as a sump pump that is also on emergency power.

#### e. INTERIOR

- Section A basement storage areas are not enclosed by 1-hour rated enclosures.
- Section A basement storage areas may have ACM and lead paint and should be tested and mitigated if required.
  - Partitions are not a rated assembly and show many breaches
  - Wet flooring
  - Upgrade walls and doors to be fire rated (all three rooms)
  - Stairs are not proper egress

- Section A basement storage areas are generally unplanned and under-utilized, but not accessible from an ADA standpoint.
- Hallways throughout:
  - Ceilings show evidence of past leaks and should be included in future finishes refresh projects
- Section A classrooms:
  - At least 50 rooms have evidence of past leaks on the ceiling tiles
  - At least 26 need their flooring replaced (19 with broken/separating tiles and 7 with carpet well beyond its lifecycle)
  - Millwork laminate is peeling away from wear and tear in most classrooms
- Toilet rooms throughout:
  - All toilet rooms on the 3rd floor have rust due to humidity and moisture
  - Boys' toilet on 2nd floor has minor cosmetic damages
  - Girls' toilet on 2nd floor has a leaking sink, broken floor tiles, and moisture issues
  - Both toilets on the 1st floor have disintegrating countertop laminate and ceiling stains
- Section A cafeteria:
  - Floor seam welds are separating (also in kitchen); minor O+M repairs are needed
  - Loading area has evident past water damage and should be part of interior finishes upgrades
- Auditorium
  - Auditorium should have aisle-way egress lighting
  - Floor tiles are popping out and should be replaced
  - Paint is peeling
  - Tiles are coming off on the second tier
- Auxiliary gym
  - Mat is peeling
- Main gym
  - Floor base is degrading
- Music room
  - Humidity and HVAC system-related moisture have also created issues in areas like the music rooms and multiple classrooms
  - The six classrooms under the auditorium adjacent to the cafeteria are underserved by the HVAC system and will need modernization

## **T. MECHANICAL AND FIRE PROTECTION**

- Rooms A160 through A165 currently do not receive proper ventilation airflow or air circulation; these spaces are only cooled by A/C units in room and do not receive ventilation air from the air handling unit
- The sump pump in the south mechanical equipment room in the A wing is broken
- Flooding has been occurring in the north A wing
- The fire pump was replaced due to damage from flooding in the north A wing
- Within room A109, the condensate piping overflowed and created flooding and mold in



- the pipe chase adjacent to it due to condensate pump failure
- One of the two chillers serving the school is broken and requires replacement or repair
- Multiple air handling units have reached their expected useful life and should be replaced

## **U. ELECTRICAL**

The building is provided with four electrical services: one 2000A and one 2500A at 480V, one 2000A and one 1200A at 208V. The combined service capacity at 20W/SF appears to be adequate for the facility (need utility bills to confirm).

2500A, 480V service enters Building A in main electrical room at the north basement. The service entrance switchboard and majority of the distribution equipment supplied from this switchboard was installed in 1998. Although switchboard appears to be in good working condition, based on the silt line observed at the switchboard, it appears that the bottom portion of the switchboard, about six inches above housekeeping pad, was exposed to or may have been submerged in water in the past. The service entrance trough above switchboard is missing cover, exposing power company service conductors.

Exit and emergency lighting, as well as elevators, jokey pump, fire alarm system and other critical equipment load are supplied from an onsite 135kW diesel generator installed in around 1998. Generator power distribution system is arranged to supply from a single automatic transfer switch (ATS) serving a distribution panel, which in turn serves various loads. This arrangement is not compliant with current code requirements of NFPA 70. However, it is functional in its current configuration and can be maintained.

The main electrical room in Wing A (south boiler room), where 2000A, 208V service switchboard and associated distribution panels are located, has significant water and moisture exposure. Equipment appears to be in good working condition and do not have any visible signs of deterioration. At the time of the visit, space had standing water with green patches of algae.

Sump pump room in the south boiler room (Building A basement), was completely flooded. Existing panel DP (800A, 480V) and a 30kVA, floor mounted dry-type transformer, both of which were installed in 1998, shows signs of water, moisture, and dust exposure. The transformer legs are rusted.

Likewise, the electrical service closet D134, in Wing D, where 1200A, 208V service and associated distribution equipment are located, has significant exposure to dust, debris and moisture.

The electrical equipment appears to be in working condition. However, considering exposure to deteriorating elements, we highly recommend inspection and testing of the equipment. At a minimum, the inspection and testing should include the following: megger testing of the main and distribution feeders to verify feeder insulation integrity; infrared testing of the main switchboard and distribution panelboards to determine potential failure areas and cleaning of all equipment – both interior and exterior.

## **V. FIRE ALARM**

The building's fire alarm and detection system was upgraded around 2006. The system is functional and being tested on regular basis. The system has remaining useful life expectancy of two to four years.

However, system lacks required voice evacuation notification. We recommend replacing the entire facility fire alarm system with a new, addressable, fire detection and alarm system with ADA compliant visual notification strobes, and voice evacuation speaker system as required per current code.

At the time of visit fire alarm control panel located in the main electrical room (Building A, north basement) had “trouble” and “partial system disable” indicators on.

Although the school has fuel-burning equipment and appliances, there are no carbon monoxide detectors. The installation of carbon monoxide detection and warning equipment is a crucial life safety component. Carbon monoxide is a colorless, odorless toxic gas produced from incomplete combustion of gas, oil, kerosene and wood. Excessive exposure to carbon monoxide may cause unconsciousness and death.

## W. CIVIL

Under development.

# RECOMMENDATIONS

## R. ARCHITECTURAL

A summary of recommendations for the building include the following:

### Priority 1

- Section B: Complete roof renovation over library. Most of the building has received new roofing with a single-ply EPDM product (project already in planning, recently to be completed by 2020).
  - Deficiency Category: Building Integrity
- Section A: Current resilient safety floor is an architectural sheet vinyl product. Although recently installed, the seams are showing some wear. ACPS needs to have a flooring company perform re-weld (minor work) on the cafeteria and kitchen floor seams. If addressed now, it will help this floor have a longer life.
  - Deficiency Category: Building Integrity
- Section A: The south basement has a large area used currently for file storage. To continue to use this area, the ACPS should perform ACM and mold testing and mitigation, repair partitions, patch and replace ceilings as needed, replace flooring with resilient flooring, and repaint all walls.
  - Deficiency Category: Environmental
- Section A: In the south basement, several areas are used for file and storage. These areas do not have a complete fire rated wall. We recommend that after remediation, ACPS refinish fire rated enclosures in basement storage areas.
  - Deficiency Category: Building Integrity, Fire/Life Safety Code, Building Code
- Section A and C: Replace roof access hatch ladders with a current safety tread model.
  - Deficiency Category: Building Integrity, Building Code

#### Priority 2

- Section A Second Floor Classroom renovations and flooring (currently funded for 2020).
  - Deficiency Category: Building Integrity, Appearance
- Section A Remove carpets and old flooring and install new resilient flooring in all classrooms (in addition to above line item additional funding and scope).
  - Deficiency Category: Building Integrity, appearance, environmental
- Section A: Paint and epoxy walls and flooring in basement north boiler and mechanical rooms after sources of plumbing leaks have been resolved.
  - Deficiency Category: Building Integrity

#### Priority 3

- Section A: Replace historic windows with custom windows damaged by moisture, prioritizing westerly side.
  - Deficiency Category: Building Integrity, Energy
- Create a staged plan for all sections to patch and repaint all classrooms and provide new resilient flooring in classrooms that have not received recent upgrades.
  - Deficiency Category: Building Integrity, Appearance

#### Priority 4

- Section A: Repoint exterior masonry.
  - Deficiency Category: Building Integrity
- Improve exterior playgrounds/sports areas (currently funded for 2026).
  - Deficiency Category: Functionality
- Improvements to Braddock field (currently funded for 2026).
  - Deficiency Category: Functionality

### S. MECHANICAL

#### T. Priority 1

- In rooms A160 through A165, we advise that supply and return ductwork be modified to provide ventilation air to these spaces. Supply and return ductwork should be routed along the perimeter of the spaces to avoid impact on low ceilings. Either a bulkhead or exposed ductwork could be provided, depending on owner preference.
  - Deficiency Category: Functionality, IAQ
- Replace the air handling units (AHUs) that have reached or exceeded their expected useful life according to ASHRAE. This equipment has been documented to be replaced and is currently scheduled for replacement between 2020 and 2023. Calculations should be performed during the design phase to determine appropriate cooling and ventilation to meet space needs and current code. Depending on the ventilation airflow, and supply airflow required, an energy wheel

may be necessary to meet current energy code. The new AHUs would contain chilled water cooling and hot water heating coils and should contain a relief fan, which will handle any exhaust requirements associated with the spaces served. The new AHU will be provided with new controls and tied into a building automation system (BAS) or can be a standalone controls system depending on owner preference. Structural modifications/reinforcement will likely need to be provided to mount the new unit on the roof. New valves and appurtenances will be provided at AHU coil connections. Ductwork should be modified/replaced to connect to the unit supply/return/relief connections and connected to existing.

- Deficiency Category: Functionality
- The chiller, which is no longer functioning, should be replaced. New piping connections, valves, and appurtenances should be replaced. Chiller tonnage provided should match existing. The new chiller should be tied into the BAS.
  - Deficiency Category: Functionality
- The sump pump in the south mechanical equipment room should be replaced. The new sump pump provided should match existing sump pump type/make.
  - Deficiency Category: Functionality
- Due to concerns about equipment/controls/pump failure for the split system serving A109, we advise that this unit and its associated condensate pump and condensing unit be replaced. This is currently scheduled to be replaced in 2024.
  - Deficiency Category: Functionality

## **U. ELECTRICAL**

Priority 2:

- Thoroughly clean, inspect and test electrical distribution equipment exposed to deteriorating agents such as moisture, water, dust, debris and dirt. Obtain services of a qualified testing agency to clean and perform NETA acceptance testing.
  - Deficiency Category: Life Safety Code Compliance, Building Code Compliance, Functionality, Energy

Priority 4:

- Implement a routine preventive maintenance program which includes cleaning, visual inspection, mechanical and electrical testing of the equipment to ensure reliable continuity of the service.
  - Deficiency Category: Functionality, Energy, Building Code Compliance

## V. FIRE ALARM

### Priority 1:

- Priority 1. Install carbon monoxide detectors in the fossil fuel burning equipment spaces and adjacent spaces as required per IFC 915.
  - Deficiency Category: Life Safety Code Compliance
- Install carbon monoxide detectors in classrooms in accordance with IFC 915.1.4. Carbon monoxide alarm signals shall be automatically transmitted to an on-site location that is staffed by school personnel.
  - Deficiency Category: Life Safety Code Compliance

### Priority 4:

- Replace the entire facility fire alarm system with a new, addressable, fire detection and alarm system with ADA compliant visual notification strobes, and voice evacuation speaker system as required per current code.
  - Deficiency Category: Life Safety Code Compliance, Accessibility Code Compliance

## W. CIVIL

Under development.

## APPENDICES

### PHOTOGRAPHS



Figure 21 Exterior Walls (weathering and mortar vanishing)



Figure 22 Wood Rot on Windows Due to Moisture





Figure 3 Greywater Collection is Poorly Set



Figure 4 Stormwater Drains at Window Edge

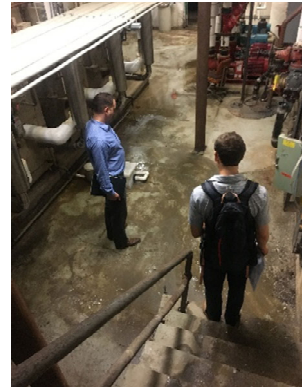


Figure 5 Boiler Room Finishes



Figure 6 Ceiling Stains

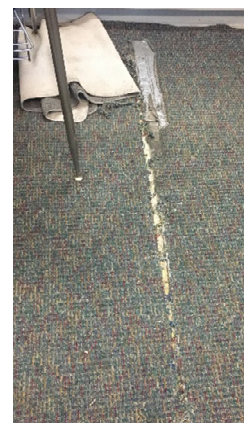
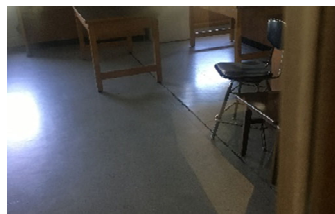


Figure 7 Flooring





Figure 8 Aged Furniture and Counter Laminate



Figure 9 Toilet Room Samples



Figure 10 Cafeteria Samples

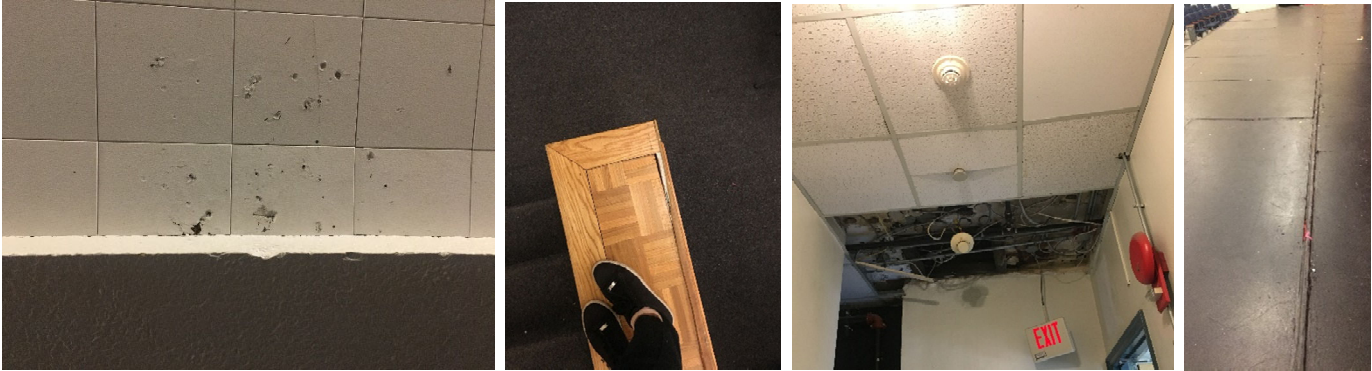


Figure 11 Auditorium Samples

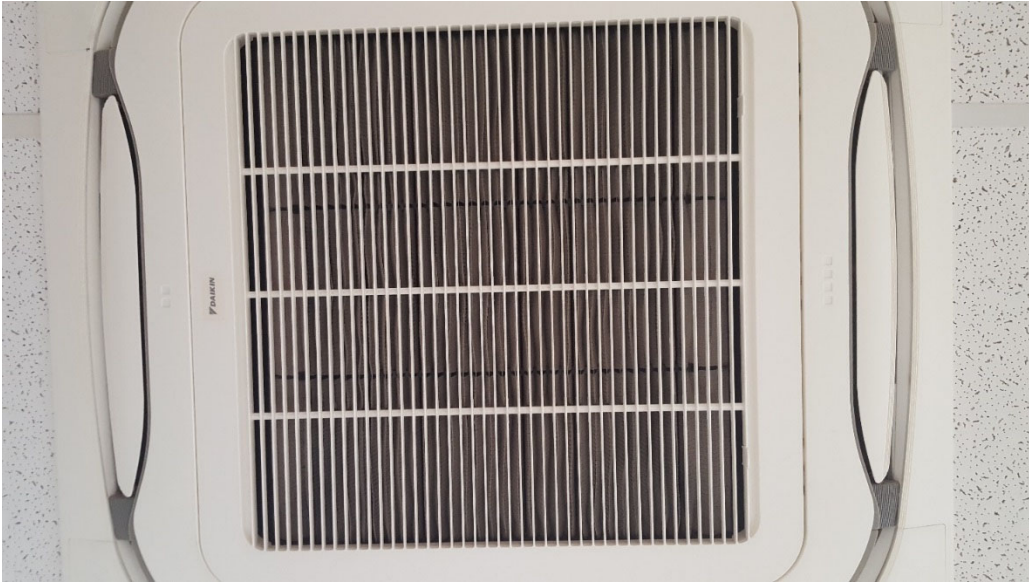


Fan coil unit found in room A113.



Unit ventilator found in room A310.





Daikin cassette in cafeteria.

**ARCHITECTURAL ROOM BY ROOM ANNOTATED SURVEY**

Room	Wall finishes failures	Flooring	Evidence of past leaks; ceiling stains	Wall paint failures	Carpet replacement	Minor finishes	Millwork laminate	No work required	Other...
A308		1					1		
A306		1							
A304									storage in electrical closet
A302						1			door missing to storage
A303				1					
A301				1		1			
A310	1								
A312						1			metal work
A314				1		1			
A315		1	1						
A316			1						
A317		1	1						
A322			1						
A330		1	1						
A333			1						
A332						1			
A335						1			
A334	1					1			
A336			1						tile swelling, unfinished surface over A/C unit
A338	1		1						wall swelling
A340	1		1						top of sill
A342	1	1							wall cracks; separations in floor tile
A344		1							
A346		1							
A348		1	1						
A353								1	

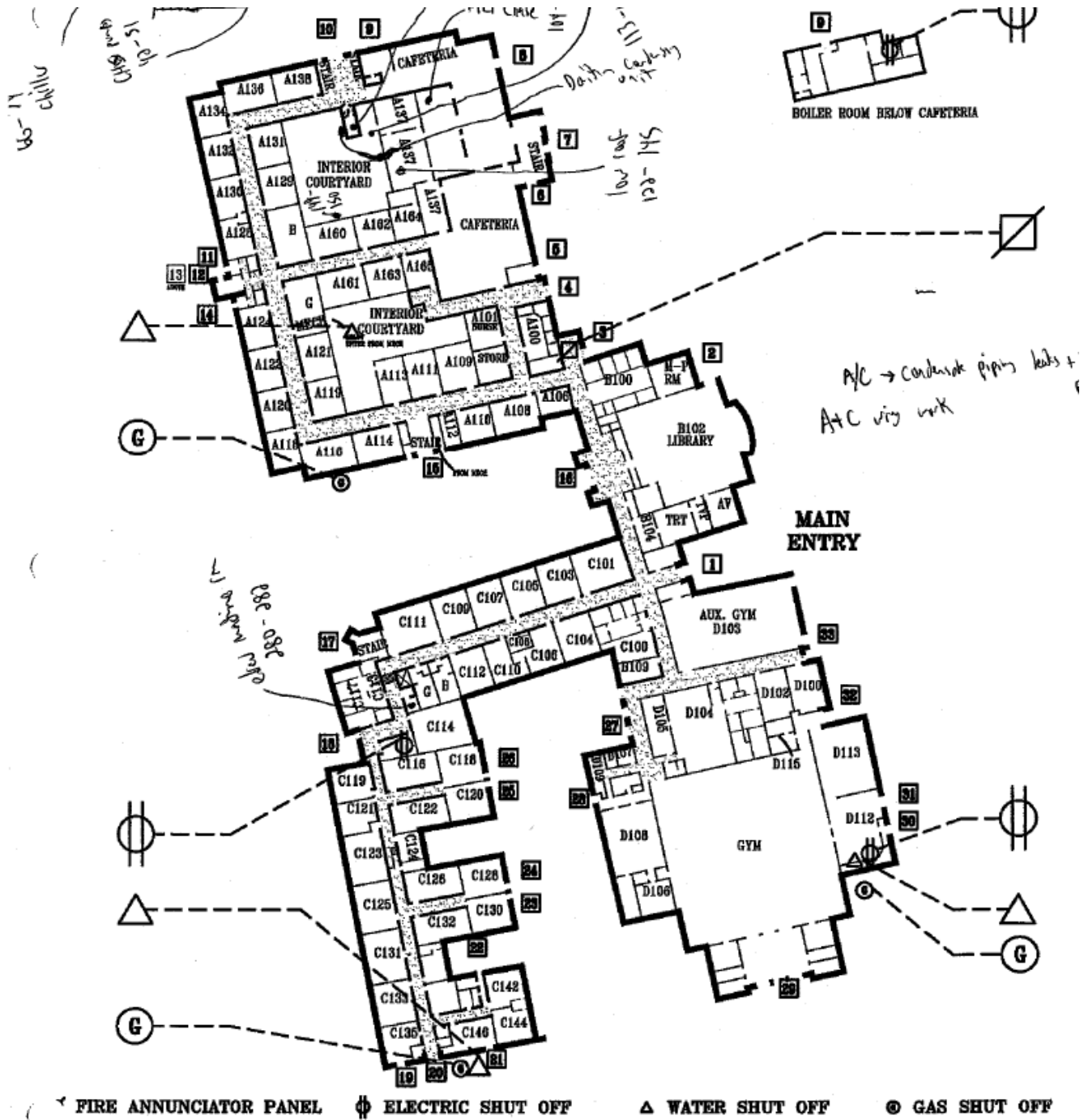
Room	Wall finishes failures	Flooring	Evidence of past leaks; ceiling stains	Wall paint failures	Carpet replacement	Minor finishes	Millwork laminate	No work required	Other...
A237			1						humidity; wood structure
A238			1						flood damage evident
A240			1						
A234			1			1			
A232 L									
A230 L									
A228 L									
A224-26			1						
A223 L								1	
A222 L			1						
A221 L						1			
A220 L	1								wall bubbling
A218 L		1							flooring bubbling
A216 L									
A215 L								1	
A214 L		1							crack along floor
A212 L									
A210 L									
A208								1	
A206		1	1						
A204	1		1						
A202		1							
A200			1						moisture near pipe
A203	1		1				1		
A201			1						
A244-46								1	
B202		1							water damage in corner
C201								1	
C203								1	
C202								1	
C205								1	
C207								1	
C204								1	

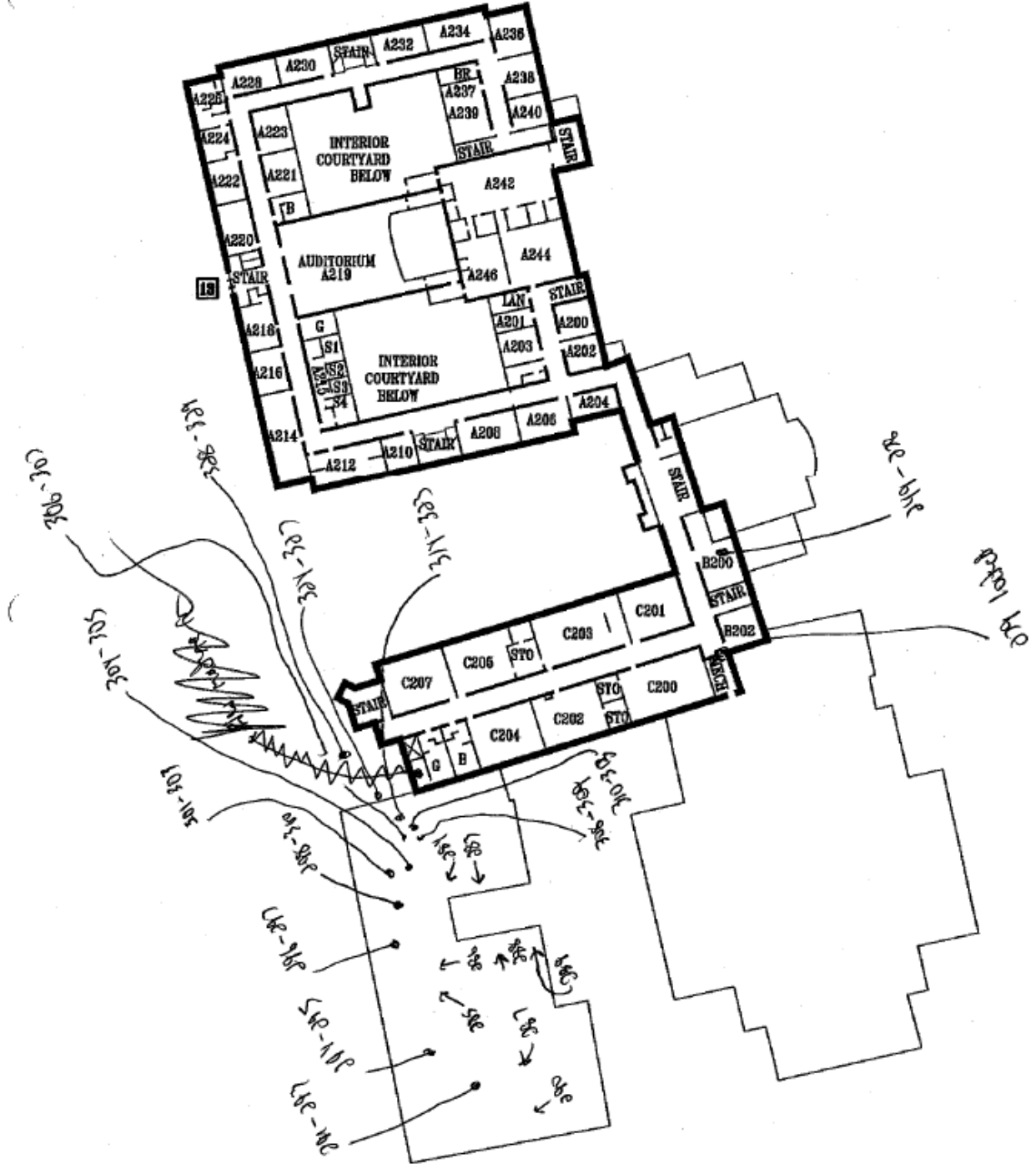


Room	Wall finishes failures	Flooring	Evidence of past leaks; ceiling stains	Wall paint failures	Carpet replacement	Minor finishes	Millwork laminate	No work required	Other...
A138	1		1						pipe leak or sweating at ceiling
A136		1	1						wood rot
A134		1							wood rot
A132						1			
A131	1			1					window has broken hardware
A130						1			ceiling tiles
A128			1						
A129			1						
A160 L									
A162 L									
A161 L	1								hole in wall
A165								1	
A163 L			1						
A124			1	1					
A122	1		1						
A121 L	1		1						HVAC sweating; wood base issues
A120	1		1						
A119		1							evidence of past water issue; manifold needs more work
A118	1								
A116			1						
A114	1		1						
A113	1								foot mold
A111			1						past water damage around A/C unit; rusting of filing cabinets
A112 L									
A110								1	
A109			1						
A101B L									
A101	1								humidity issue; potential mold; hook by door
A100	1		1						threshold needed
A106								1	
B101-2				1	1				
B104								1	
C101							1		cracks on ACT
C103				1		1			hook by door
C104							1		
C106							1		
C110							1		

Room	Wall finishes failures	Flooring	Evidence of past leaks; ceiling stains	Wall paint failures	Carpet replacement	Minor finishes	Millwork laminate	No work required	Other...
C108			1						
C107			1				1		
C105			1						wear and tear
C112							1		
C109			1						
C113			1	1			1		
C114					1				
C119								1	hook by door
C121		1							
C123		1	1	1					system sweating
C125	1			1					
C131			1	1			1		missing brick
C133					1				
C135								1	
C137			1						
C148			1						water damage
C146			1				1		
C144			1						system
C142								1	
C140			1						
C136			1						floor out of level
C132									
C130							1		
C128				1					exterior door needs weather stripping
C126				1			1		leaked water on gutter line
C122							1		replace base
C120				1	1		1		
C118					1		1		base outside of wall
C116					1		1		evidence of work
B109					1				evidence of moisture
D100			1						
D102			1				1		rubber wall bases
D104	1								
Total 130	21	19	50	14	7	12	18	18	

## FLOOR PLAN DIAGRAMS











**ALEXANDRIA CITY  
PUBLIC SCHOOLS**



ALEXANDRIA CITY PUBLIC SCHOOLS

MATTHEW MAURY ELEMENTARY SCHOOL



---

**A/E TEAM:**

**PRIME - HENRY ADAMS, LLC CONSULTING  
ENGINEERS**

**ARCHITECT - ECO-MAR, LLC**

**STRUCTURAL ENGINEER - ALBRECHT  
ENGINEERING, INC.**

**CIVIL ENGINEER - CLARK | AZAR &  
ASSOCIATES, INC.**

---

**Targeted Condition Assessment**

**Final Report**

**August 9, 2019**

## GENERAL

### F. FACILITY DESCRIPTION

Henry Adams, LLC was tasked by the Alexandria City Public Schools (ACPS) System to conduct a physical survey to provide a comprehensive study report documenting conditions and issues at the Matthew Maury Elementary School.

Matthew Maury Elementary School was originally built as a 6-classroom school in 1929. Additions to that original building occurred in 1941, 1949 and 1961, resulting in the multi-wing massing of the current building. In 1971, the gymnasium was also added. Rebuilding has undergone multiple renovations including roof replacements in 1995 and 2005, window replacements in 1992, a significant HVAC overhaul in 2001 and 2005, other building systems and finishes in 2002 and 2005. Most recently, a central media center was added in 2005 as a renovation of the original stage and auditorium. The building now totals 51,800 SF and sits on a 3.43-acre site. The main building is a neo-colonial building with similar style additions flanking it. The north addition is distinctly modern and reflective of the 1961 style when it was built. The multi-purpose room/gym is also a distinctly modern building designed in the stark style of 1971 institutional architecture. The building currently services a K-5 curriculum.

The building can be broken into three distinct architectural styles. The tying elements are the use of brick and use of painted trim elements.

- Section A - The original building and associated additions are located on the southern side of the site. Facing Russell Road is a brick masonry building with wood trims and windows that is generally a neo-classical style of architecture.
- Section B - The 1961 classroom wing was constructed to the northern side of the site and is a mixture of international style architecture with classical trims. The materials are brick, wood trim, painted metal facias, and large expanses of glass.
- Section C - The 1971 multipurpose room and gym is a solid brick building with standing seam metal roofs at the lower building masses, with minimal fenestration.

The building's envelope is constructed in a variety of styles attributed to the era of their construction:

- Section A – This portion is a brick on block structure with a mixture of masonry bearing walls and steel column structures with steel framed and concrete deck floor and roof slabs and some trussed slabs of pavilion roofs. The main entrance is marked by a grand colonnade portico with classical columns and a great pediment. There is no ADA access here as the level is accessed via a stair plinth. The roofing in this section is predominantly a single-ply TPO membrane roof with a slate tiled roof over the media room pavilion hipped roof. There is a parapet around most of the perimeter roofs with a mixture of center area drains. However, the rear of the building features sheet flow drainage to a gutter system. There is a crawl space beneath the building. Some limited areas have basements that were originally mechanical and storage spaces. The old boiler room under the northern 1949 addition is no longer in use with all equipment abandoned in place. Fenestrations are traditional double hung windows that are a mixture of large classroom style windows and smaller bubble glass toilet room windows.
- Section B – This portion features brick on block structure end walls and low walls with large expanses of modern glass windows and transoms. The roof is a low sloped single-ply TPO membrane roof draining to

gutters that are along the edge façade. The fenestrations are distinctly modern in their geometry but were constructed with trims that are intended to go with the older buildings. The building sits on a crawl space.

- Section C – This portion features brick on block structure with very few windows. The building has a single-ply TPO membrane roof and some lower roofs that are standing seam. This appears to be a slab on grade structure.

The surveys resulted in discovery of numerous issues and concerns contributing to unsatisfactory conditions within the building.

Remediation action associated with each of the deficiency are identified in SECTION III. RECOMMADATIONS.

## **L. SUMMARY OF FINDINGS**

The surveys resulted in discovery of numerous issues and concerns contributing to unsatisfactory conditions within the building. Refer to Section II. FINDINGS for detailed description of issued discovered. In summary, the following issues were discovered:

- The TPO roofing is nearing the end of its useful life. The details of water flow to edge gutters that are not detailed with deep overhangs has tended to make the exterior walls vulnerable to water intrusion due to overflow of downspouts.
- There are instances of damaged brick and stone around the perimeter of the building.
- Throughout the building interior and exteriors there are instances of large and small settlement cracks.
- The front of the building needs to be designed for access control and ADA compliance.
- Several gutters drain to uncontrolled landscaping adjacent to the building. Past success has occurred to redesign these areas to capture the water in a storm water pipe to rout to the street.
- Throughout the building, the windows of classical and modern additions are significantly beyond their useful life, leading to energy loss. Also, these act as safety egress/escape routes, which makes the failure in the operations of these windows problematic. The modern windows are too large, with uncontrolled daylight. And, due to their aged design, they lack the thermal energy efficiency of modern windows.
- There were several residential grade doors installed in closets of Section A. They were poorly installed, and the closets do not function well.
- Water infiltration and pipe leaks have left blemishes on the interiors throughout the buildings.
- Classroom carpeting has not aged or performed well, and should be replace with resilient flooring.
- There is no connection to elevated spaces for ADA compliance.

## **M. COST**

Refer to APPENDIX XX for ROM estimate associated with each remediation project identified.

## FINDINGS

### X. ARCHITECTURAL

#### a. ROOFING

- Water retention on roofs causing leaks (Figure 23). The roof is nearing the end of its useful life.
- The details of water flow to edge gutters not detailed with deep overhangs has tended to make the exterior walls vulnerable to water intrusion due to overflow of downspouts.

#### b. EXTERIOR WALLS

The coping on the roof of exterior walls has drastically aged causing peeling and rotting. The roof drains the water right at the windows (especially in the cafeteria), causing rotting of windows (Figure 24).

A visible deep crack is spotted on the entrance steps. These damaged steps should be rebuilt (Figure 25).

#### c. WINDOWS

Window sweating is visible in a few classrooms and the overall conditions of the exterior windows and door are not good. Window and door frames are peeling and rotting (Figure 26).

#### d. STORMWATER DRAINAGE

The detail for gutters and rain leaders should be redesigned and replaced as part of the roof replacement. In addition, there are many instances of draining leaders directly into landscaped area adjacent to the exterior wall. This type of detail, left unmanaged, has tended to result in erosion around the perimeter wall as well as potential subsurface water infiltration on below-grade spaces. The school successfully took care of this problem in the main entrance by installing stormwater piping to direct that roof stormwater to the street system.

#### e. INTERIOR REPAIRS

Thirteen classrooms show strong evidence of ceiling leaks and stains (Figure 27). More than five classrooms have aged carpets, which need to be replaced (Figure 28). The gym toilets, kitchen toilet and the boys' toilet are non-ADA compliant. A couple of classrooms need their closet doors and floor to be fixed (Figure 29). A couple of rooms need wall finishing (Figure 30). When the roof, window, and plumbing water infiltration has been mitigated, then PCPS should engage in a phased implementation of spot finishing and interior renovations to include replacement and refinishing of interior wall painting, ceilings, carpets, and doors and trims.

## **Y. MECHANICAL AND FIRE PROTECTION**

The school is served by 16 gas fired packaged rooftop units. Four of the units were replaced earlier this year and it is our understanding that the remaining units will be replaced in conjunction with the roof replacement project this summer. It was mentioned that music room 12 has temperature control issues.

There gas piping on the roof to RTU-6 is not adequately supported and is sagging in several locations possibility from someone standing on it.

In general, the roof drainage appears to be adequate and is predominately a roof drain interior piping system, but there are also some areas that consist of gutters and downspouts. These downspouts typically discharge at the right at the foundation wall and are not directed away from the building.

The majority of the building has a crawl space under the floor. There are several areas where the crawl space vent openings have had the exterior grates missing which can allow vermin to enter the crawl space. In other instances, the openings have been covered in plexiglass which does not allow adequate ventilation of the space which can allow moisture to buildup in the space.

The majority of the plumbing fixtures in the original portion of the building are operable but generally in poor condition and should be replaced. The fixtures are also not up to current standards for water consumption.

There are two domestic water heaters. One is located in a basement mechanical space that also houses an old abandoned boiler and is a very wet environment. This water heater was manufactured in 2015 and is already showing signs of exterior rusting due to the environmental condition of the space and because it is installed directly on the concrete floor. The other water heater is located in a different basement area that is not wet but it is beyond its useful life and should be replaced.

The building is fully sprinklered.

## **Z. ELECTRICAL**

Matthew Maury Elementary School is provided with a 1200-amp, 480Y/277-volt, three phase, four-wire service from Dominion Virginia Power (DVP). The service originates from a DVP pole-mounted transformer located outdoors. Overhead service entrance conductors enter the basement electrical room, and terminate on the main 1200-amp fused service entrance disconnect located above a wire trough. A 300KVA 480-volt primary-208Y/120V secondary transformer is located in the electrical room. The transformer serves panel "NMDP".

## **AA. FIRE ALARM**

The school's fire alarm and detection system was manufactured by Notifier, Model FireWarden-100. The system is functional and is being tested annually as required. The system, however, lacks required voice evacuation notification, which is required by current building codes. Hence, it is recommended to replace the system in its entirety with a new, addressable, fire detection and alarm system with ADA and NFPA 72 compliant visual notification strobes, and voice evacuation speaker system.

Although the school has fuel-burning equipment and appliances, there are no carbon monoxide detectors in the school. The installation of carbon monoxide detection and warning equipment is a crucial life safety component. Carbon monoxide is a colorless, odorless toxic gas produced from incomplete combustion of gas, oil, kerosene and wood. Excessive exposure to carbon monoxide may cause unconsciousness and death.

## **BB. CIVIL**

Under development.



## RECOMMENDATIONS

### X. ARCHITECTURAL

#### Priority 1

- Replace existing low-sloped roofing with EPDM single ply roofing on rigid insulation. Construct roof extensions with architectural cornice trims and vented soffits for gutters to mitigate water overflow on walls.
  - Deficiency Category: Building Integrity, Energy

#### Priority 2

- For the growing population of students, projecting out in the next decade, the ACPS has reviewed and budgeted construction and renovation of the existing school and an additional 2 modules. They have created a budget projected for 2030.
  - Deficiency Category: Functionality
- Repair damage to brick and stone and repoint. Reconstruct exit stairs. Perform brick repair and repointing, sealant at joints, and new sills. Rebuild exterior concrete exit stairs.
  - Deficiency Category: Building Integrity, Environmental
- Reconstruct existing damaged built-in gutters, exterior trims, and cornices. Repaint all trims, replace wood as required.
  - Deficiency Category: Building Integrity
- To seal areas with gaps and cracks due to differential building movement and settlement, we recommend the use of expansion and control joints. We recommend the use of flexible sealant control joint and expansion joint details to be used at transitions between buildings to mitigate past settlement issues.
  - Deficiency Category: Building Integrity
- Replace classroom carpeting throughout with resilient flooring. Existing carpeting is worn, a tripping hazard, and a collector of dust and potentially mold. It will be a vast improvement to use architectural vinyl or sustainable resilient flooring products.
  - Deficiency Category: Building Integrity, Environmental, Functionality
- Existing windows are wood, double hung, with a historic design. Many are not operating correctly, have failing thermal performance, and are rotting. The team recommends that the ACPS replace all windows including:
  - Existing historic quality windows with custom insulated commercial grade aluminum energy efficient windows to match
  - Existing aluminum framed windows with new windows to match
  - Spot replace damaged stone sills on the exterior and wood sills on the interior during window replacement.
    - Deficiency Category: Building Integrity
- Create master plan for entry vestibule and security area. This will require the potential for expansion into the portico for vestibule and interior renovations to create the security enclosure that is now preferred in the ACPS schools. In addition to the access control and energy efficiency measures, it is important to address the ADA compliance for an improved barrier free experience to all populations

attending or working in the school. We recommend the design integrates creation of a wheelchair access in this front entry.

- Deficiency Category: Building Integrity, Functionality, Code Compliance, Energy, Accessibility Code Compliance, Security

#### Priority 3

- Perform lifecycle painting and finishes. Spot patch and refinish in interiors to remediate past water infiltration and leaks.
  - Deficiency Category: Building Integrity
- Replace closet doors in classrooms.
  - Deficiency Category: Building Integrity
- Some new spaces were designed for the old elevated stage areas. We recommend ACPS add chair lifts to connect elevated spaces for ADA compliance.
  - Deficiency Category: Accessibility Code
- Continue to reroute gutter into underground system as was done in earlier renovations.
  - Deficiency Category: Building Integrity

#### Priority 4

- Removed all materials in abandoned boiler basement, mitigate harmful substances, rebuild stair access, install sump pumps, and reprogram space as needed.
  - Deficiency Category: Building Integrity, Functionality, Environmental

## Y. MECHANICAL

#### Priority 1

- Music room 12 should be provided with individual control damper for temperature adjustment and electric with electric heat/reheat.
  - Deficiency Category: Energy, Functionality

#### Priority 2

- Direct roof drain piping discharge away from the building to prevent water infiltration in at the foundation.
  - Deficiency Category: Energy, Functionality, Building Integrity
- Replace the existing plumbing fixtures with new code compliant fixtures to reduce water consumption.
  - Deficiency Category: Energy, Functionality
- Replace the existing water heaters and install on an elevated stand to keep them off of the floor.
  - Deficiency Category: Building Integrity

#### Priority 3

- All of the rooftop gas piping supports should be replaced and adequately spaced during the roofing project.
  - Deficiency Category: Energy, Functionality

#### Priority 4

- The old boiler room should be thoroughly cleaned up, the boiler and all associated abandoned in place

pipings removed.

- Deficiency Category: Energy, Functionality

## Z. ELECTRICAL

Priority 2:

- It is recommended to perform a study of existing exit and emergency lighting system to further evaluate adequacy of the system and to provide supplemental emergency lighting units to meet minimum means of egress light level requirements.
  - Deficiency Category: Life Safety Code Compliance

Priority 4:

- Implement a routine preventive maintenance program which includes cleaning, visual inspection, mechanical and electrical testing of the equipment to ensure reliable continuity of the service.
  - Deficiency Category: Functionality, Energy, Building Code Compliance
- Consider installation of occupancy-based lighting controls throughout the facility to conserve energy, and to comply with the applicable requirements of Energy Code IECC 2015.
  - Deficiency Category: Functionality, Energy, Building Code Compliance

## AA. FIRE ALARM

Priority 1:

- Priority 1. Install carbon monoxide detectors in the fossil fuel burning equipment spaces and adjacent spaces as required per IFC 915.
  - Deficiency Category: Life Safety Code Compliance
- Install carbon monoxide detectors in classrooms in accordance with IFC 915.1.4. Carbon monoxide alarm signals shall be automatically transmitted to an on-site location that is staffed by school personnel.
  - Deficiency Category: Life Safety Code Compliance

Priority 4:

- Replace the entire facility fire alarm system with a new, addressable, fire detection and alarm system with ADA compliant visual notification strobes, and voice evacuation speaker system as required per current code.
  - Deficiency Category: Life Safety Code Compliance, Accessibility Code Compliance

## BB. CIVIL

Under development.



## SUPPLEMENTAL INFORMATION

### PHOTOGRAPHS



Figure 1: Roof leaks











Figure 2: Exterior coping



Figure 3: Crack on the entrance steps





**Figure 4: Window frames**





Figure 5: Ceiling stains



Figure 6: Cracked floor



Figure 7: Carpet





**Figure 8: Wall finishes**

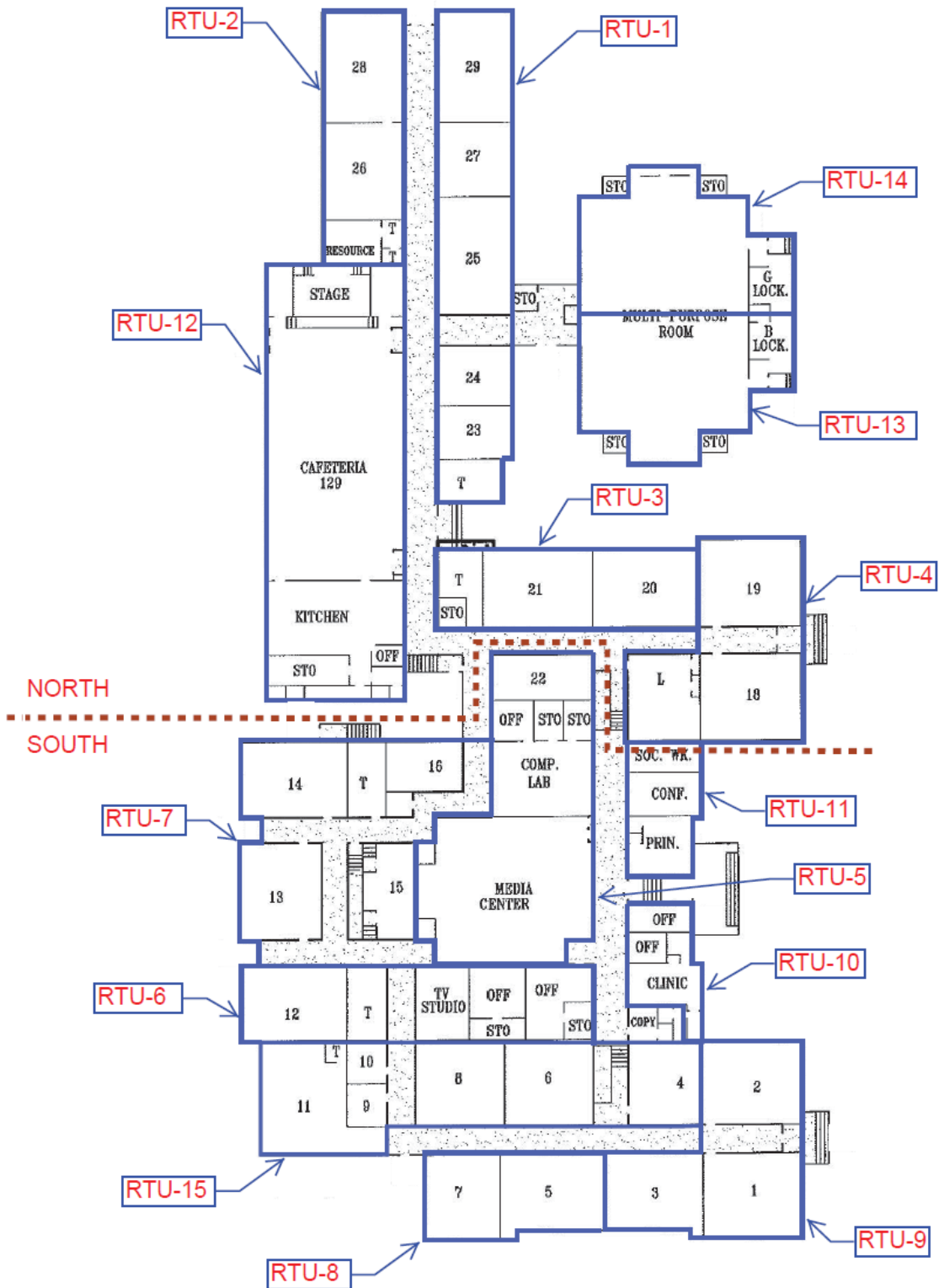
**ARCHITECTURAL ROOM BY ROOM ANNOTATED SURVEY**



Mathew Maury School  
 Architectural room by room annotated survey  
 27-Jun-19

Room	Wall Finish Issues	Flooring	Evidence of Past Leaks; Ceiling Stains	Wall Paint Peeling	Aging Carpet	No Work Needed	Other comments
1							window water damage
2							closet doors need to be commercial grade; needs stainless steel door holds; gutter system
3							closet doors need to be commercial grade; needs stainless steel door holds; gutter system
4				1			
5				1			closet doors need to be commercial grade; needs stainless steel door holds; gutter system
6							inadequate dimming
7				1			fix carpet transition
9						1	
10						1	
11	1			1			cracking near door
12			1				window gasket failure
13					1		closet doors need to be commercial grade
14		1	1				closet doors need to be commercial grade
15	1				1		wall to ceiling transition
16			1		1		
18			1				mechanical noise
19							closet doors need to be commercial grade; uneven floor; frame cracking
22			1				
24			1				
25							hole in ceiling
26			1		1		
27			1				
28			1		1		carpet transition
29			1				built on crawl space

**FLOOR PLAN DIAGRAM**





**ALEXANDRIA CITY  
PUBLIC SCHOOLS**



ALEXANDRIA CITY PUBLIC SCHOOLS

TRANSPORTATION FACILITY



---

**A/E TEAM:**

**PRIME - HENRY ADAMS, LLC CONSULTING  
ENGINEERS**

**ARCHITECT - ECO-MAR, LLC**

**STRUCTURAL ENGINEER - ALBRECHT  
ENGINEERING, INC.**

**CIVIL ENGINEER - CLARK | AZAR &  
ASSOCIATES, INC.**

---

**Targeted Condition Assessment**

**Final Report**

**August 9, 2019**

## GENERAL

### G. FACILITY DESCRIPTION

Henry Adams, LLC was tasked by the Alexandria City Public Schools (ACPS) system to conduct a physical survey to provide a targeted condition assessment documenting conditions and issues at the Transportation Facility.

The Transportation Facility is a two-story building, built in 1975 to house 60 employees. The upper level is dedicated to administrative functions including offices, bathrooms (one men's/one women's), training/meeting area, and lunch/break room with janitorial closet. The lower level includes bus maintenance bays, storage and utility areas, and a men's-only locker room (no locker room for women anywhere in facility).

The building is an industrial brick and block structure with a low sloped standing steam metal roof, with perimeter gutters and downspouts.

The site and facility are now undersized as the county system has expanded significantly since the facility was constructed. There are now 150 bus drivers and more than 100 buses cycling through the facility, as well as the on-site bus maintenance staff. The site is sloped and has inadequate area for buses and parking. Previously, the facility could use neighboring lots for bus parking. However, the new police department building has taken over a portion of the original bus parking lot, so the ACPS transportation facility lot size is now inadequate for accommodating the school bus fleet. Currently, ACPS uses rented space down the street for parking overflow.

The building deficiencies are many, and the condition of the facility can be summarized as being grossly out of date, inadequate in size, in poor overall condition, and non-ADA compliant, with numerous complaints of air quality problems.

### N. SUMMARY OF FINDINGS

The surveys resulted in discovery of numerous issues and concerns contributing to current or future issues, which are leading to unsatisfactory conditions within the building. To summarize, issues discovered included the following:

- Building is in very poor condition and generally is undersized for current use.
- Bus repair bays are too few, too small, and are using outdated equipment.
- Restrooms are too small for the bus driver population.
- Locker rooms are undersized to accommodate the staff.
- Site area is inadequate for bus parking.
- Facility is non-ADA compliant throughout.
- Roof has numerous recurring leaks and other problems; patching has not provided good long-term solution, so full replacement is necessary.
- Air conditioning unit in the lounge is not functioning.
- Ventilation air is not being provided or is not being provided to meet code.

- There is insufficient bathroom space/capacity to serve the quantity of occupants currently in the building. There is often a wait time to use the restrooms.
- There is no heat or air in parts of the lower level including the locker room.
- Within the lounge, only one of the four split system indoor units is currently functioning.
- The air handling unit serving the upper level office area is beyond its useful life.
- Temperature sensors for the unit heater within the stairwell are not functioning properly.
- The boiler is currently functioning, but is beyond the typically life expectancy.
- The fume extraction system within the garage area is aged and may not be meeting current code requirements.
- Electrical distribution system throughout the building is original to building and though functional, is beyond its useful life.
- NEC required working space about electrical equipment is being used for storage.
- Receptacle outlets throughout the dispatch office, training room, administrative offices, private offices office spaces are inadequate in their placement and quantities.
- A non-explosion-proof switch was observed in the battery storage room, which is also being used as a tire storage room.
- Power panel PPB supplied from 150kVA transformer does not have required overcurrent protection device as required per NFPA 70.
- Electrical equipment installed in the small engine repair bay shows signs of wear and exposure to deteriorating agents and contaminants that compromise the integrity of the equipment and connections.
- Fire alarm system does not include visual notification devices. The system is local alarm only.
- Several outlets are missing cover plate.

## **O. REMEDIATION APPROACH**

Phased master replacement plan for either full renovation and expansion or full replacement.

Option 1: Repairs to existing system:

- Roof replacement
- Damp proofing and drainage of foundation walls
- Window replacement
- Toilet room renovations
- Door replacements

Option 2: Additions and expansion to the building should add up to 12,000 SF and include phased renovations of existing facilities. The current site should be reorganized for bus parking, and the ACPS will be required to use remote neighboring lots.

Option 3: Full replacement. Ideally, the project should include approximately 50,000 SF building and a mixture of parking structures and on-grade parking to fit the growing quantity of buses and take advantage of the sloped site.

## **P. COST**



Option 1 Repairs

- Roof replacement = \$250,000
- Damp proofing and drainage of foundation walls = \$300,000
- Window replacement = \$ 100,000
- Toilet room renovations = \$ 250,000
- Interior architecture finishes and doors - patching and refinishing = \$750,000
- (MEP)
- (Other)

Option 2 Comprehensive renovations and additions: \$ 8,400,000

Option 3 Full replacement: \$ 16,000,000

## FINDINGS

### CC. ARCHITECTURAL

#### a. GENERAL

While the team will record building deficiencies that need to be corrected, the glaring problem with this building is that it is inadequately sized and equipped for the needed function. While repairs can be executed, they will not overcome the problems of inadequate size and accommodation that currently plague this facility.

#### b. ROOFING

Current roof is a low sloped standing seam metal roof. There are obvious signs of regular leaking. These types of roofs are very difficult to maintain and difficult to keep watertight. Standing seam roofs are better for 3:12 slopes, and this roof appears to be closer to 1:12. The roof drains to a gutter at the roof's edge. This condition can also create water overflow and wash across the walls below when heavier rains, snow and ice, or debris, interferes with the regular flow of water. When any kind of rebuilding of the roof occurs, it will require architectural work to accommodate the appropriate low-sloped system including insulation, drainage, access, and roof equipment service accommodations. It is recommended to remove all materials to the structural decking and build up and new insulated multi-ply membrane roofing system with new extended overhangs and gutters with downspouts.

#### c. EXTERIOR WALLS

The walls are generally grid-block veneer on concrete block backup with some overhanging metal clad manifold bays. The general condition of these walls is that they are in fair shape above grade but require waterproofing and water management measures below grade.

There is a make-shift exterior entry shelter and seating area. While it appears to be the commendable efforts of the staff and ACPS to create a staff area, the structure is not built in a complete and finished way and will likely not withstand the test of time.

#### d. WINDOWS

Windows are generally beyond their useful lives and should be replaced with energy efficient commercial grade aluminum systems.

**e. STORMWATER DRAINAGE**

(Civil engineering)

**f. INTERIOR REPAIRS**

All areas have old finishes that are beyond their useful life. There are areas in the lower level where there is evidence of ground water intrusion.

The toilet rooms and locker areas are non-ADA compliant as well as undersized for the needs of the building. These facilities will need to undergo a full renovation and expansion in place. This may also require reducing the sizes of other spaces in the facility to accommodate.

**DD. MECHANICAL, PLUMBING AND FIRE PROTECTION**

- The air conditioning unit in the lounge is broken and a temporary spot cooler was installed to assist in cooling and de-humidification.
- Since the majority of spaces are currently being served by split systems or spot coolers and not air handling units, ventilation air is not being provided or is not being provided to meet code. This is leading to poor air quality concerns. There is no DOAS unit to provide ventilation for rooms being served by split systems only.
- It was noted that there is insufficient bathroom space/capacity to serve the quantity of occupants currently in the building. There are small bathrooms upstairs and downstairs that do not have sufficient toilets/urinals to serve the occupants. There is often a wait time to use the restrooms.
- It was described that there is no heat or air in parts of the lower level, including the locker room. Units serving the locker room were described as typically non-functioning.
- It was discussed that the roof has no roof access ladder/hatch and there is no walkway to service/inspect existing equipment on the roof. It was noted that based on the roof construction, walking appears to damage the joints/seals in the roof. The existing roof is a metal standing seam roof type.
- Within the lounge, there are four split system indoor units on a single outdoor unit. However, only one of the four split system indoor units are currently functioning.
- The upper level office area is served by an aged air handling unit. The unit lacks proper filtration as evident from dirt and dust directly outside of the diffusers in the space. In addition, the unit is very loud and was described as being distracting by the persons working in the area served by the unit.
- The unit heater within the stairwell was described as having nonfunctioning temperature sensors and/or controls. It was noted that this area turns on in summer and overheats the space, and that even in the winter, the unit overheats the space it serves. To prevent heating in summer, the unit is disconnected.
- The boiler is currently functioning, but is beyond the typically life expectancy.

- The fume extraction system within the garage area is aged and may not be meeting current code requirements.

## EE. ELECTRICAL

Electrical service to the building is rated at 1200A, 120/208V, 3-phase, 4-wires. Although demand metering data was neither recorded nor available for the building, electrical service rating of 1200A appears to be adequate for current building use.

The existing electrical distribution system serving the building is original to the building, manufactured and installed in late 1970s, and operating beyond its useful life expectancy of 30 years. Equipment condition varies from poor to fair. Hence, the electrical distribution system shall be considered for replacement.

The existing 16kW, natural gas-powered generator appears to be in good condition. The generator is adequate to support building's exit and emergency lighting loads. Replacement is not recommended at this time.

Exit and emergency lighting is by normal power and battery powered units. Battery units are being tested on annual basis and based on the testing label appears to be in good working condition, except for the one installed in the stairwell. The unit is installed at the ceiling which is not accessible and has not been tested.

Working space about electrical equipment is being used for storage. Stored material does not maintain code required access and working clearances about electrical distribution equipment.

Receptacle outlets throughout the dispatch office, training room, administrative offices, private offices office spaces are inadequate in their placement and quantities. Several surface mounted raceways were observed serving added surface mounted outlets as well as extension cords.

Lighting fixtures within the bay area and small engine repair bay are high-bay LED fixtures installed within the last two years. Light levels in the bays appear to be adequate. Light fixtures within office / admin type spaces are generally T8 fluorescent with a combination of recessed and surface mounted fixtures. Light levels appear to be adequate, except in the locker rooms. Lighting is controlled by manual toggle switches.

Exit signs with battery backup are provided throughout the facility and are adequate. Emergency lighting is provided by emergency battery unit fixtures located throughout and appears to be adequate except for the battery unit fixture installed in the stairwell, which is installed at the ceiling and not accessible for annual testing. Hence, it is unknown if the unit is still functional providing required emergency power illumination.

Hazmat Storage Rooms – electrical installation within this space appears to be per Class 1, Division 2 installation requirements. Explosion-proof light fixtures and switches, manual starter, junction boxes, and conduit seals were observed for majority of the installation. However, a non-explosion-proof special outlet has been installed in the flammable liquids storage space. A non-explosion-proof switch was observed in the battery storage room, which is also being used as a tire storage room.

General convenience power and lighting panelboards are original to the building and are manufactured by

GE. OEM replacement breakers and components are not readily available in aftermarket.

Power panel PPB supplied from 150kVA transformer does not have required overcurrent protection device as required per NFPA 70.

Electrical equipment installed in the small engine repair bay shows signs of wear and exposure to deteriorating agents and contaminants that compromise the integrity of the equipment and connections.

Several outlets are missing cover plates. An outlet in the first-floor entry vestibule is not secured in the outlet box and is partially protruding out. Missing plate and unsecured outlet expose the wiring to elements and creates unsafe, life safety hazard condition.

## **FF. FIRE ALARM**

The existing fire alarm system serving the building is a manual, local alarm system only. The system consists of pull stations and alarm bells only. The fire alarm system does not include visual notification devices. The system is beyond its useful life. It is recommended to replace fire alarm system with an addressable fire alarm detection and notification system with remote monitoring by a central station.

Although the facility has fuel-burning equipment and appliances, there are no carbon monoxide detectors in the building. The installation of carbon monoxide detection and warning equipment is a crucial life safety component. Carbon monoxide is a colorless, odorless toxic gas produced from incomplete combustion of gas, oil, kerosene and wood. Excessive exposure to carbon monoxide may cause unconsciousness and death.

## **GG. CIVIL**

Under development.

## RECOMMENDATIONS

### CC. PROJECT IMPLEMENTATION APPROACH:

The ACPS needs to engage in efforts to create a phased master replacement plan for either full renovation and expansion or full replacement. The team reviewed 3 distinct approaches that would be interim repairs to existing facilities, addition, and expansion of the existing facilities and new facilities which are summarized in the following bullets:

- Option 1: Repairs to existing system:
  - Roof replacement
  - Damp proofing and drainage of foundation walls
  - Window replacement
  - Toilet room renovations
  - Door replacements
  - Interim drivers lounge in modular trailers (currently funded for 2020)
- Option 2: Additions and expansion to the building should add up to 12,000 SF and include phased renovations of existing facilities. The current site should be reorganized for bus parking, and the ACPS will be required to use remote neighboring lots.
- Option 3: Full replacement. Ideally, the project should include approximately 50,000 SF building and a mixture of parking structures and on-grade parking to fit the growing quantity of buses and take advantage of the sloped site.

### DD. ARCHITECTURAL

Based on the above approaches the architectural/master plan recommendations are as follows:

#### Priority 1

- Option 1: Repairs to existing system, replacement of existing low-sloped roof. Build eave extensions and new gutters. Build up insulation on existing/new steel decking and install EPDM single-ply roofing system.
  - Deficiency Category: Building Integrity, Energy, Environmental
- Option 2: Additions and expansion to the building should add up to 12,000 SF and include phased renovations of existing facilities. The current site should be reorganized for bus parking and the ACPS will be required to use remote neighboring lots.
  - Deficiency Category: Building Integrity, Functionality
- Option 3: Full replacement Ideally the project should include approximately 50,000 SF building and a mixture of parking structures and on-grade parking to fit the growing quantity of buses and take advantage of the sloped site.
  - Deficiency Category: Functionality



- Option 1: Interim drivers lounge in modular trailers (currently funded for 2020).
  - Deficiency Category: Functionality
- Option 1: Toilet room renovations: The existing public toilets are inadequate on multiple levels. The upper floor toilets are intended to serve the drivers lounge. There are inadequate stalls to handle the shift surges. These toilets are incorrectly sized and configured for ADA compliance. The recommendation is to rebuild these toilets and reclaim additional space out of the drivers lounge areas. At minimum we would recommend the men's toilet be 2 urinals, 2 WC and 3 sinks and the female's toilet should be 2 WC (or more) and 2 sinks. This is predicated on the interim addition of the trailers and the long-range addition of additional building areas.
  - Deficiency Category: Building Integrity, Functionality, Accessibility Code

Priority 2

- Option 1: Repairs to existing system, water proofing and drainage of foundation walls through phased excavation, sealing of existing cracks, water proofing wall, and installation of drainage mesh, stone drainage and French drain.
  - Deficiency Category: Building Integrity, Environmental
- Option 1: Interior renovations of doors and all finished areas. This includes comprehensive repainting, new ceilings, and resilient flooring and includes replacement of all interior doors. This work would be performed only after the roofing and foundation waterproofing has occurred.
  - Deficiency Category: Building Integrity, Appearance

Priority 3

- Option 1: Replacement of existing windows shall include removal of existing windows and replacement with commercial grade, energy efficient aluminum framed windows.
  - Deficiency Category: Building Integrity

**EE. MECHANICAL, PLUMBING AND FIRE PROTECTION**

Priority 1

- Provide new exhaust fans along with new fume extraction arms for use in the garage/shop areas. At this time, we suggest that a single fan shall be provided for each garage bay to provide for some airflow capacity control and energy savings. When a garage bay is not in use, the fan can be turned off to provide for energy savings.
  - Deficiency Category: Functionality, Energy, Environmental, IAQ
- Replace existing HVAC system with new central unit.
 

Provide a new air handling unit (AHU) to serve the upper and lower offices. The new AHU should contain DX cooling and hot water heating coils. Calculations would have to be performed to determine if an energy wheel will be necessary and the quantity of supply and outside airflow necessary to meet both the cooling and ventilation requirements for the current occupancy of the building. All split systems and spot coolers would be removed in this scenario. The new air handling unit should contain a relief fan which to handle exhaust requirements in the toilet rooms and locker room if an ERV is not provided. The new air handling unit should be provided with new controls and tied into a BAS system or can be a stand-alone controls system depending on owner preference.

Structural modifications/reinforcement will likely need to be provided in order to mount the new unit on the roof.

Provide a new duct chase to route supply and return ductwork to the lower level. On both the upper and lower level, the ductwork should be routed along the perimeter to provide proper airflow. Ductwork should be routed along the perimeter in order to not limit/reduce ceiling heights. Ductwork could be exposed or concealed within a bulkhead depending on owner preference. Heating water piping should be routed from the boiler room up through the roof to the new AHU. New valving and appurtenances would be required. The AHU should be mounted on a vibration isolation curb at the roof to reduce noise impact on occupants below.

- Deficiency Category: Functionality, Energy, Environmental, IAQ

## Priority 2

- Provide new unit heaters within the garage/shop area, and within the stairwell(s). The new unit heaters would be provided with new controls that are either a standalone system or will be tied into a BAS depending on owner preference. Heating water piping would be routed from the boiler room to each new unit heater.
  - Deficiency Category: Functionality, Energy
- Provide new boilers and pumps. We recommend that condensing boilers be provided for energy efficiency and long-term cost savings. New heating water piping and insulation should be provided in the vicinity of the boiler. It is suggested that two boilers be provided for redundancy. Boilers should be sized for full load by a single boiler. New piping should be provided and routed to new equipment which utilizes the heating water system. New valves, controls and appurtenances are suggested to be provided.
  - Deficiency Category: Functionality, Energy

## FF. ELECTRICAL

### Priority 1:

- Remove stored materials to provide access and code required working space for panelboards and electrical equipment throughout the facility.
  - Deficiency Category: Life Safety Code Compliance.
- Provide an emergency battery pack unit in the stairwell in an accessible location where it can be tested and maintained.
  - Deficiency Category: Life Safety Code Compliance.

### Priority 3:

- Provide additional receptacle outlets to suit space use. At a minimum, provide a quad outlet for each workstation.
  - Deficiency Category: Functionality, Building Code Compliance

- Install missing receptacle outlet cover plates. Secure / replace protruding outlet(s).
  - Deficiency Category: Functionality, Building Code Compliance

Priority 4:

- The electrical distribution system is functional at present. However, it has served beyond its useful life expectancy. Replace the system under future renovation / upgrades to the building.
  - Deficiency Category: Functionality, Energy, Building Code Compliance, Life Safety Code Compliance
- Implement a routine preventive maintenance program which includes cleaning, visual inspection, mechanical and electrical testing of the equipment to ensure reliable continuity of the service.
  - Deficiency Category: Functionality, Energy, Building Code Compliance
- Use existing generator capacity to provide backup power to exit and emergency lighting, fire alarm system, security system, data communication equipment etc.
  - Deficiency Category: Functionality, Building Code Compliance, Energy

## GG. FIRE ALARM

Priority 1:

- Install carbon monoxide detectors in the fossil fuel burning equipment spaces and adjacent spaces as required per IFC 915.
  - Deficiency Category: Life Safety Code Compliance

Priority 2:

- Provide a new, addressable fire alarm detection and notification system with remote monitoring by a central station. The system shall include manual pull stations, alarm notification by means of ADA compliant strobes and horns / bells. The system shall include a digital alarm communication transmitter (DACT), which transmits alarm, supervisory and trouble conditions to central monitoring station. The system shall interface with the fire protection system as required.
  - Deficiency Category: Life Safety Code Compliance

## HH. CIVIL

Under development.



SUPPLEMENTAL INFORMATION

PHOTOGRAPHS

Roof



Figure 1. Roof – Leaks, corroded seams and surfaces, gutter detail and incomplete canopy

Exterior Conditions



Figure 2. Exterior water damage due to roof drainage failures



*Figure 3: Examples of water infiltration and subsurface breaches in exterior enclosure*

**Upper Level**



*Figure 4: Patchwork measures to correct HVAC inadequacies*



*Figure 5: Women's Bathroom – Examples of water damage from leaks*



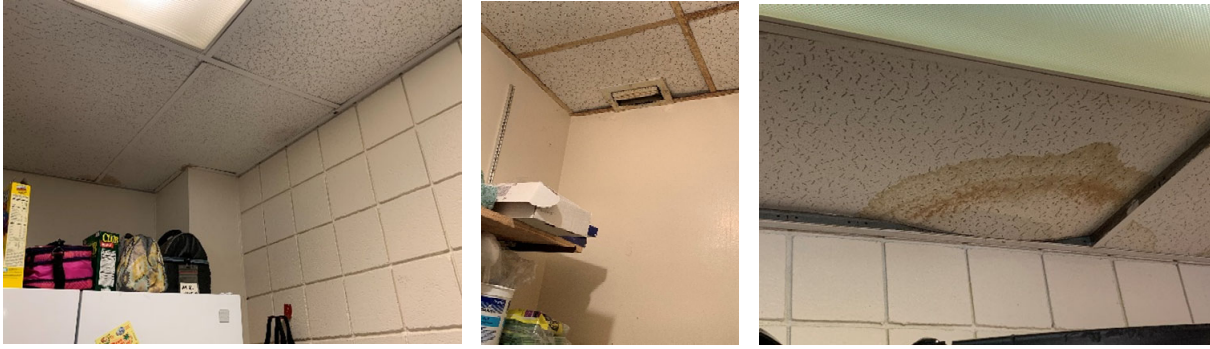


Figure 6: Examples of roof leaks and damaged ceiling tiles throughout upper level



Figure 7: Entry area - Damaged floor tiles

### Lower Level

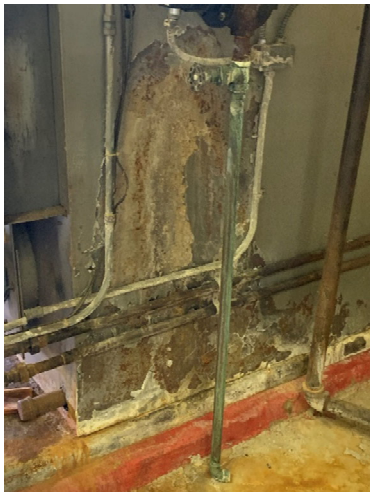


Figure 8: Example of ground water infiltration in utility and bus bays



Figure 9: Example of leaks prevalent in high bus bays



Figure 10: Fire Alarm Control Panel – Local Alarm Only



Figure 10: Non-Explosionproof Outlet Located in the Flammable Liquids Storage Space





Figure 11: Non-Explosionproof Switch Located In the Battery Storage Space



Figure 12: Panelboards and Transformer Exposed to Deteriorating Elements and Being Obstructed by Storage



Figure 13: Panelboards and Switchboard Being Obstructed by Storage

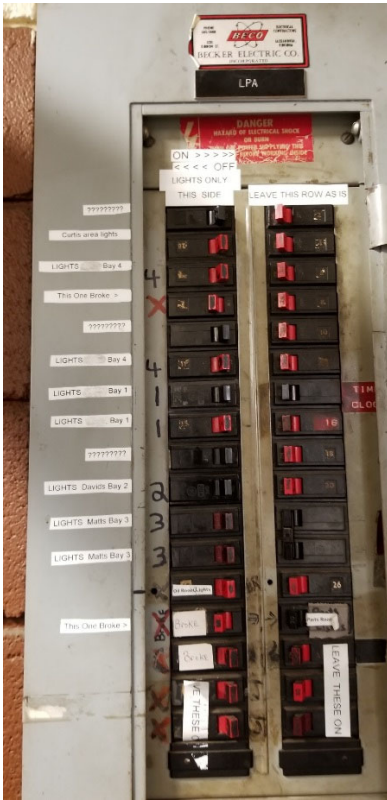


Figure 14: Panelboard LPA



Figure 14: Exposed Wiring to Parking Lot Light Fixture



SPOT COOLER



SPLIT SYSTEM AIR CONDITIONER





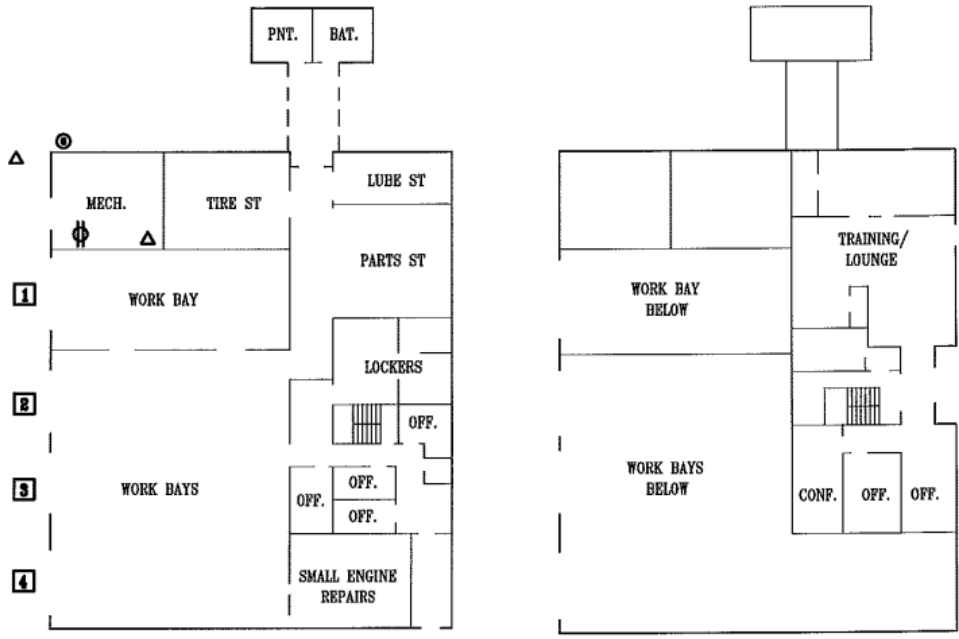


UNIT HEATER



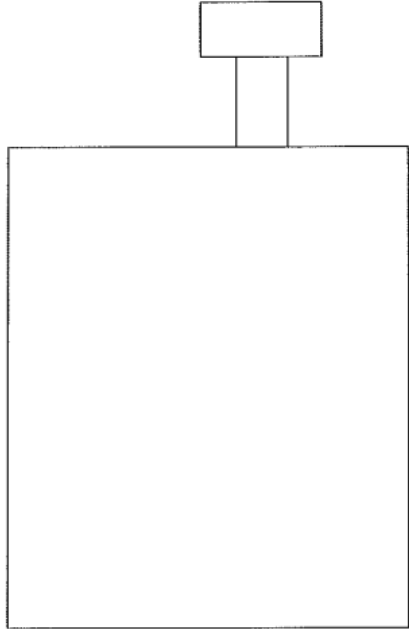
BOILER

**FLOOR PLAN DIAGRAMS**



LEVEL ONE

LEVEL TWO



ROOF

▽ FIRE ANNUNCIATOR PANEL
⊕ ELECTRIC SHUT OFF
△ WATER SHUT OFF
⊙ GAS SHUT OFF

**Transportation Facility**  
 1540 Wheeler Ave.  
 Alexandria, Va 22304  
 T) 703-461-4165



**Alexandria City Public Schools**  
 2000 North Beauregard Street  
 Alexandria, Va 22311  
 (T) 703-824-6600  
 (TDD) 703-824-6666  
 (EMER.) 703-868-5300

## IV. APPENDICES

### APPENDIX A – LIST OF INSPECTION REPORTS PROVIDED TO A/E TEAM – FULL REPORTS AVAILABLE BUT NOT INCLUDED WITH THIS REPORT

#### ***Draft Facility Condition Assessments Prepared by EMG, Corp:***

<u>Facility</u>	<u>On-Site Date</u>	<u>Date of Report</u>
Cora Kelly Elementary School	March 13, 2015	April 24, 2015
Francis C. Hammond Middle School	March 30, 2015	April 30, 2015
George Mason Elementary School	March 19, 2015	April 27, 2015
George Washington Middle School	April 1, 2015	May 7, 2015
Matthew Maury Elementary School	December 2, 2008	March 2, 2009
Transportation Facility	N/A	No Report

#### **Full Roof Inspection Reports Prepared by TREMCO incorporated:**

<u>Facility</u>	<u>Date of Report</u>
Cora Kelly Elementary School	July 25, 2017
Francis C. Hammond Middle School	June 11, 2019
George Mason Elementary School	June 11, 2019
George Washington Middle School	June 11, 2019
Matthew Maury Elementary School	March 31, 2017
Transportation Facility	June 11, 2019

**APPENDIX A (continued) – LIST OF INSPECTION REPORTS PROVIDED TO A/E TEAM**

**AHERA Management Plan Prepared by ECS Mid-Atlantic, LLC:**

<u>Facility</u>	<u>Date of Report</u>
Cora Kelly Elementary School	April 11, 2017
Francis C. Hammond Middle School	April 11, 2017
George Mason Elementary School	April 11, 2017
George Washington Middle School	April 11, 2017
Matthew Maury Elementary School	April 11, 2017
Transportation Facility	N/A No Report

**Fire Alarm Annual Inspection Reports Prepared by SimplexGrinnell DC Metro #564:**

<u>Facility</u>	<u>Date of Report</u>
Cora Kelly Elementary School	October 19, 2016
Francis C. Hammond Middle School	December 6, 2017
George Mason Elementary School	October 18, 2016
George Washington Middle School	September 16, 2016
Matthew Maury Elementary School	August 30, 2016
Transportation Facility	October 17, 2016

**APPENDIX A (continued) – LIST OF INSPECTION REPORTS PROVIDED TO A/E TEAM**

**Sprinkler System Annual Inspection Reports Prepared by SimplexGrinnell DC Metro #564:**

<u>Facility</u>	<u>Date of Report</u>
Cora Kelly Elementary School	September 28, 2015
Francis C. Hammond Middle School	September 26, 2016
George Mason Elementary School	N/A No Sprinkler System
George Washington Middle School	June 12, 2017
Matthew Maury Elementary School	February 5, 2018
Transportation Facility	February 27, 2017

**Elevator Inspection Certificates Prepared by City of Alexandria Department of Code Administration:**

<u>Facility</u>	<u>Date Certificate Expires</u>
Cora Kelly Elementary School <ul style="list-style-type: none"> <li>• Wheelchair Lift</li> </ul>	Lift Certificate not available
Francis C. Hammond Middle School <ul style="list-style-type: none"> <li>• Elevator No. 1</li> <li>• Elevator No. 2</li> <li>• Elevator No. 3</li> <li>• Elevator No. 4</li> </ul>	March 31, 2019 March 31, 2019 March 31, 2019 March 31, 2019 (Lift Certificate)
George Mason Elementary School <ul style="list-style-type: none"> <li>• Elevator No. 1</li> </ul>	November 30, 2018
George Washington Middle School <ul style="list-style-type: none"> <li>• Elevator No. 1</li> <li>• Elevator No. 2</li> <li>• Elevator No. 3</li> </ul>	March 31, 2019 March 31, 2019 July 31, 2018 (Lift Certificate)
Matthew Maury Elementary School	N/A - No elevator or lift
Transportation Facility	N/A – No elevator or lift

**APPENDIX A (continued) – LIST OF INSPECTION REPORTS PROVIDED TO A/E TEAM**

**Generator System Maintenance Inspection Reports Prepared by WesMart, Inc.:**

<u>Facility</u>	<u>Date of Report</u>
Cora Kelly Elementary School	N/A – No Generator
Francis C. Hammond Middle School	N/A - No Generator
George Mason Elementary School	August 13, 2015
George Washington Middle School	September 3, 2015
Matthew Maury Elementary School	N/A – No Generator
Transportation Facility	N/A – No Generator

**Structural Investigation Letter Report Prepared by WDP & Associates, Consulting Engineers :**

<u>Facility</u>	<u>On-Site Date</u>	<u>Date of Report</u>
Cora Kelly Elementary School	April 13, 2017	April 24, 2017