ALEXANDRIA CITY
PUBLIC SCHOOLS

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

October 14, 2019

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I. EXECUTIVE SUMMARY

HENRY ADAMS, LLC was tasked by the Alexandria City Public Schools (ACPS) system under Contract No. 2019082 to provide comprehensive condition audits and plant capital renewal analyses for the following six facilities (listed in alphabetical order):

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

Under this contract, the A/E team consisted of the following disciplines:

- Mechanical, Electrical, Plumbing, and Fire Protection Systems HENRY ADAMS, LLC
- Architecture - ECO-MAR, LLC
- Civil - Clark | Azar & Associates, Inc.
- Structural - Albrecht Engineering, Inc.

The A/E team conducted visual surveys of the facilities to assess the following:

- Mechanical, electrical fire protection building envelope, roofing, and structural systems.
- Building, fire and life safety code deficiencies
- ADA compliance issues.
- Exterior conditions of the grounds.
- 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.

The A/E team also reviewed the limited plans and documents available from ACPS to 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, as well as humidity and water intrusion issues.

Priority Levels

The team assigned the following priority levels to the deficiencies identified in the field audits*:*

1. Priority Level 1. **Currently Critical**. Conditions in this category require immediate action to address the following:

    a. Correct a cited safety hazard.
    b. Stop accelerated deterioration.
    c. Return a facility to operation.
2. Priority Level 2. **Potentially Critical.** Conditions in this category, if not corrected expeditiously, will become critical within two years. Deficiencies in this category include the following:
    a. Intermittent operations.
    b. Rapid deterioration.
    c. Potential life safety hazards.
3. Priority Level 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.
4. Priority Level 4. **Recommended.** Conditions in this category include items that represent a sensible improvement to existing conditions. While these are not required for the most basic function of the facility, Priority 4 projects will improve overall usability and/or reduce long-term maintenance costs.

Rationale for Assigning Priority Levels

We primarily assigned priority levels for correcting or mitigating deficiencies based on how soon a building will be replaced. Where ACPS has indicated the intention to design and construct a larger, new replacement school (or renovate and expand a school), we considered the immediacy of the replacement in our prioritization.

- We placed a lower priority on the replacement of large systems in facilities where we assigned Priority Level 1 to the building replacement project.
- We assigned Priority Level 1 to the building replacement project based on conditions in the building, for example, the dire condition of the fire alarm system or the absence of a fire sprinkler system, or both.
- We have, however, assigned Priority 1 levels to mitigate conditions that affect occupant safety and health (for example, mold) due to building systems failures. Even though the building will be replaced, the environment of the existing building must remain suitable for occupants until the replacement school is operational.

For two schools in particular, Cora Kelly and George Mason, the team assigned the Priority 1 Level to total building replacement rather than to life safety and other system renovations such as carpeting, playgrounds, and track and field improvements.

We would like to further articulate why the George Mason modernization should be a Priority 1 even though we documented less than $1M of miscellaneous Priority 1 work.

- George Mason does not have a fire sprinkler system. Without a doubt, a full sprinkler system should have been installed decades ago. With school replacement identified to occur in the next several years, why install a sprinkler system now?
- The school's fire alarm control panel is obsolete and long past due for replacement. Roof leaks cause short circuits in smoke detectors that result in nuisance alarms.
- Many of the classroom windows, which serve as emergency rescue openings, have broken hardware and are difficult to operate.
- The school is replete with flooding and moisture issues. Flooding in the basement

mechanical/electrical rooms has resulted in a build-up of moisture and the potential for mold. Water puddles on the floor of the basement electrical room are located in the NEC required work space in front of and around the electrical equipment. This poses a very serious electrocution hazard.

- Due to the need for storage space, the school has converted the north and south wood-framed attics to storage rooms. The conversion of the attic space has resulted both a change in occupancy and use classification and in an increase in fire load.
- ACPS has identified funding in 2024 to replace George Mason Elementary School. Since the building will only be in use for (and razed within) another several years, the team did not assign Priority Level 1 to replacing the fire alarm system nor did we identify the need to install a sprinkler system
- If the replacement of the building is to be delayed for any reason, the Priority 1 category should most definitely be assigned to the replacement of the fire alarm system.

ACPS has identified funding in 2027 to replace Cora Kelly Elementary School. We assigned Priority 1 to the Cora Kelly modernization since the school is located in a flood plain which makes the building more vulnerable to water and moisture infiltration. This condition creates the compelling need for replacement in order to remove the school from the risk of failure due to flooding.

- The building does not have full fire sprinkler protection. Only the new wing is sprinklered.
- Similar to George Mason, the school's fire alarm control panel is obsolete and long past due for replacement.

We also assigned Priority Level 1 to the installation of a hydraulic elevator. If the school will be replaced (rather than renovated), however, it might not make sense to invest in the elevator. This decision should take into consideration the timing of the school's replacement.

The above rationale for assigning priority levels also applies to the ACPS Transportation.
The entire Transportation Facility is in dire need of replacement. 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.
For this reason, the complete replacement of this facility has been identified under Priority Level 1.
Refer to "Summary of Findings" item 3 below, "Failing Equipment" for additional deficiencies.

A. SUMMARY OF FINDINGS

The team identified numerous issues and concerns. Detailed findings for each facility, as well as recommended corrective actions are included in *Section III* of this report, *"Detailed Building and Deficiency Data.*" We have organized *Section III* to present our findings for each facility in chapter form. Each chapter serves as a standalone facility condition assessment report, complete with photographs, architectural room-by-room annotated surveys, floor plan diagrams, structural assessments (where applicable) and civil site plan exhibits.

Below is a summary of the team's findings. The most critical items, in the opinion of the team, are listed first and foremost with subsequent deficiencies categorized in descending order of severity.

1. The Absence of Carbon Monoxide Detection and Warning –This is a Priority 1, **Currently Critical** issue and applies to all of the facilities we surveyed.

There are presently no carbon monoxide detection and warning systems in place in any of the facilities we surveyed, even though fuel-burning equipment and appliances (water heaters, boilers, kitchen equipment, etc.) serve the buildings' hot water, heating, and cooking needs. Carbon monoxide (CO) detection and warning equipment is a critical life safety component. This safety hazard must be corrected as soon as possible.

2. <u>Water and Moisture Conditions</u> – This is a Priority 1, **Currently Critical** issue and has been identified in the following schools we surveyed: Cora Kelly, FC Hammond, George Mason, George Washington and Matthew Maury.

   The team identified the following moisture sources in the schools:
   - Leaks from roofs, windows, and plumbing.
   - Condensation on cold surfaces including poorly insulated walls, windows and ductwork, non-insulated cold water pipes.
   - Flooding and wet foundations from landscaping or gutters that direct water into and around the buildings.

   We have assigned the "Priority 1, **Currently Critical"** level to the water and moisture conditions because entrance of water into damaged, poorly designed, and improperly maintained buildings is a primary source of toxicants. Excessive moisture in the buildings must eliminated in order to prevent favorable conditions for mold growth and to prevent illness from mold exposure.

   Schools also serve as a resource to the communities they serve. The buildings need to be resilient to disruptive events such as super-storms. Where flooding or other weather-related disruptive forces could force a school or its critical systems into failure, priorities should be given to short term repair measures in conjunction with the long-term priority to replace the building.

   Below are the water and moisture conditions we identified in each school:

   a. Cora Kelly
      i. The building is located in a flood plain which makes the building more vulnerable to water and moisture infiltration. This condition creates the compelling need for future replacement in order to remove the school from the risk of failure due to flooding.
      ii. 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 or replacement.
      iii. Mechanical equipment roof penetrations and duct insulation have been damaged, contributing to water infiltration issues.
      iv. Exposed ductwork on the roof is in poor condition resulting in energy loss and water infiltration.
      v. There is evidence of water ponding on some of the ducts.
      vi. The present roof drainage appears to promote, rather than prevent, ponding in areas.
      vii. In the "well" area of the roof, construction debris is causing water to damn, preventing it from flowing to the roof drains.

viii. As stated previously, the building is located in a flood plain. The ground floor is constructed on an elevated slab with steel trusses over a crawl space. The crawl space is no longer ventilated even though it is required to be (the vents have been sealed). Improper or no ventilation increases the risk of humidity build-up which has the potential of damaging the structural steel and floor slab. The fact that the school was constructed on a flood plain increases the risk of wet crawl spaces from landscaping or gutters that direct water into and around the building.

ix. There is limited storm drainage and minimal stormwater management on this site. There appear to be no inlets to receive drainage from the site. The roof appears to drain via drains within the building that tie in underground.

x. The courtyard area needs to be regraded to provide positive drainage and direct water away from the building.

xi. There appear to be under-floor water issues in Classroom 2. Given the fact that the classroom is located over a crawl space, we do not believe the water is coming from subsurface ground sources, but it may be the result of an under-floor plumbing issue either in the domestic water systems or in the fire suppression piping under this area.

xii. The backflow preventor and main valve for the sprinkler service is located in the crawl space. This not only makes it difficult for personnel to inspect and test the valve (out of sight, out of mind), this causes (and has caused) water and moisture issues in the crawlspace when leaks occur.

xiii. The aluminum insulated windows are sweating and show thermal integrity failures that suggest a need for replacement.

xiv. Insulation on interior ductwork is damaged and missing in areas, exposing the ducts and increasing the risk of condensation forming on the duct surface.

While the above items are fixable, the school remains vulnerable to water and moisture issues due to its location in a flood plain. If the school is to remain in its current location, stakeholders must recognize the risk and determine whether the building has the resilience to survive a flood event.

b. FC Hammond

i. In general, FC Hammond Middle School has issues with water damage due to recurring leaking of the roof and flooding of the building’s lower level.

ii. The roofing over D wing has had extensive failures. Although the roof appears to be more recently installed, there are hundreds of patches where leaks and other failures have occurred. The interiors of this wing have been damaged from these failures, including the second-floor boys’ room which has been closed for two years.

iii. At the mono-directional roofs that drain with sheet flow toward a gutter, there is no overhang for the gutter. This creates a situation where the overflowing gutters can wash their overflow across the façades. This can lead to water damage.

iv. At the cafeteria areas around Stair 9, Classroom 002 (Figure 6), and the 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.

v. 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. The water penetrates through the basement wall and flooding occurs in this corridor. The slab at this corridor is failing. The structural engineer's assessment of the slab indicates that the concrete slab has some hairline cracking and spalling in two concentrated areas. Spalling areas are approximately 6" x 2'-0" x 1" deep. The concrete should be repaired to prevent further spalling. Additionally, the crawl space beneath the area may require a new vapor barrier and drainage to prevent future flooding and damage to the slab.

vi. As indicated above, 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. The structural engineer's assessment of the steel framing above area indicates that, while there are no apparent signs of section loss, two brace angles are very rusted and seem to be failing at the welded joints where there is significant deflection.

vii. Interior courtyard stormwater drainage issues; In the enclosed courtyard, several roof leaders have long corrugated pipes to direct water away from the building, however, they do not have positive slope and are causing wet areas and ponding on the surface. Roof leaders near canopy structures at all doors discharge onto the sidewalk. Areas along the perimeter of the courtyard were graded to drain back toward the building in several locations. The basement stairs had an undersized drain at the bottom, and it was noted by the school's staff that the area experienced flooding during severe rain events.

viii. In the southern courtyard, the grades on the north side of this courtyard direct water toward the foundation instead of away from it.

ix. Missing insulation on Chilled Water Piping 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.

c. George Mason

i. This building has expanded in a patch-work of renovations and expansion projects, over the years. The current building is undersized and equipped with out of date facilities. The study concurs with the direction of constructing a replacement facility and shows this as a priority.

i. Roof Issues: There are signs of leaks in the TPO roofing system evidenced by ceiling leaks throughout.

ii. There was some ponding of water noted on the roof and these areas should be addressed.

iii. 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.

iv. Exterior brick walls have poor drainage (the bricks are moist/moldy). There are a few areas with settlement cracks.
v. Stormwater from roof downspouts discharges at building foundation walls directing water into the building instead of away from it.
vi. In the areaways at classroom 4 and classroom 3, the roof drains onto a landing and is not properly piped away from the building.
vii. Flooding in basement mechanical/electrical rooms have resulted in a build-up of moisture and the potential for mold.
viii. Electrical Room Flooding – We observed water puddles on the floor of the basement electrical room. The puddles are located in the NEC required work space in front of and around the electrical equipment. This poses a very serious electrocution hazard. Where water cannot be prevented from infiltrating this and other building areas, there should be redundant sump pumps and drainage pipe infrastructure.

d. George Washington
   i. Window Issues
   ii. Water intrusion issues were seen throughout the basement areas.
   iii. 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.
   iv. Water drainage and through-wall infiltration may be caused by the courtyards where roof drains are gathering.
   v. The front courtyard contains one inlet, but there is no positive flow of the courtyard area to the inlet.
   vi. The southern courtyard contains a landscape infiltration area and several inlets which appeared to be clogged. Roof leaders in the side courtyard were not connected to the downspouts.
   vii. Humidity and HVAC system-related moisture has 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.
   viii. The sub basements in Section A have also experienced ground water intrusion and flooding.
   ix. Other moisture and water intrusion currently affecting the interior appear to be due to uninsulated HVAC piping sweating.
   x. Rooms A160 through A165 currently do not receive proper ventilation airflow or air circulation; these spaces are only cooled by A/C units in each room and do not receive ventilation air from the air handling unit.
   xi. The sump pump in the south mechanical equipment room in Section A is broken
   xii. Flooding has been occurring in the north area of Section A.
   xiii. In room A109, the condensate piping overflowed and created flooding and mold in the pipe chase adjacent to it. This was due to condensate pump failure
   xiv. One of the two chillers serving the school is broken and requires replacement or repair.

e. Matthew Maury

i. Water retention on roofs is causing leaks and the TPO roofing is nearing the end of its useful life.
ii. The details of water flow to edge gutters that are not provided with deep overhangs is making the exterior walls vulnerable to water intrusion due to overflow from downspouts.
iii. The coping on the roof of exterior walls has drastically aged, causing peeling and rotting. The water drains from the roof right at the windows (especially in the cafeteria), causing the windows to rot.
iv. Several downspouts 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.
v. Stormwater from roof discharges at foundation walls. downspouts typically discharge right at the foundation wall instead of being directed away from the building.
vi. There are many instances where downspouts drain directly into landscaped areas ("rain gardens") adjacent to exterior walls. This type of detail, if left unmanaged, will result in erosion around the perimeter wall as well as potential subsurface water infiltration on below-grade spaces.
vii. Window sweating is visible in a few classrooms and the overall conditions of the exterior windows and doors are not good. Window and door frames are peeling and rotting.
viii. There is excessive moisture in the basement mechanical room.
ix. Numerous crawl space vents are sealed with plexiglass, preventing proper ventilation of the crawl space. Without adequate ventilation, moisture will buildup in the space.

3. Failing Equipment

The team has identified failing equipment as Priority Level 1, **Currently Critical**. This applies to the Transportation Facility on a whole building basis. With respect to the schools, this priority level category applies extensively to equipment necessary for ventilation, air quality, moisture control, dehumidification and thermal health, in other words, equipment that is crucial for the control of mold growth. Where replacement is not immediately required, a Priority Level 2**, Potentially Critical** has been noted.

a. ACPS Transportation Facility - Priority Level 1, **Currently Critical**
   i. As stated previously, the building deficiencies are many.
   ii. The building is in very poor condition and is undersized for its current use.
   iii. There are insufficient quantities of bus repair bays. The dimensions of the bays are not adequate for modern (longer) school buses, and the equipment is outdated.
   iv. The site area is inadequate for bus parking.
   v. The restroom facilities are inadequate. The quantity of toilets, urinals, and sinks are insufficient to serve the sheer number of personnel currently using the building. There is often a wait time to use the restrooms. This is problematic during shift changes.

vi. Locker rooms are undersized to accommodate personnel. There is also no heat or air conditioning in the locker rooms.
vii. The facility is non-ADA compliant throughout.
viii. The roof has numerous recurring leaks and other problems. Patching has not provided a good long-term solution, so full replacement is necessary.
ix. The majority of HVAC equipment is non-functioning. There are numerous complaints of air quality problems.
x. 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 in quantities to meet code. This is leading to poor air quality concerns.
xi. There is no heat or air in parts of the lower level including the locker rooms.
xii. Within the lounge, only one of the four split system indoor units is currently functioning.
xiii. The air handling unit serving the upper level office area is beyond its useful life.
xiv. Temperature sensors for the unit heater located in the stairwell are not functioning properly.
xv. The boiler is currently functioning, but is beyond the typical life expectancy.
xvi. The fume extraction system in the service bay and garage area is aged. It is likely that the system does not meet current code requirements.
xvii. Electrical distribution system throughout the building is original to the building and although functional, is beyond its useful life.

b. Cora Kelly - Priority Level 2**, Potentially Critical**

i. The school's 14 packaged rooftop units, installed in 1994, are well beyond their useful life. Although most of the units appear to be functioning currently, work orders indicate that several heat exchangers have been replaced. We observed extensive damage to the condenser fins on several of the units. This 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 since service must be performed by using a ladder.

c. FC Hammond - Priority Level 1, **Currently Critical**

i. AHU-2 serves the auxiliary gym. The unit is no longer functioning properly. It cannot meet the required cooling capacity and dehumidification needs of the spaces it serves.
ii. AHU-4 has a broken return fan which is resulting in to dehumidification issues. The unit is operating beyond its life expectancy. If cannot meet the required cooling capacity and dehumidification needs of the spaces it serves.
iii. AHU-5 serves the cafeteria. The unit is no longer functioning properly due to age. It cannot meet the required cooling capacity and dehumidification needs of the spaces it serves.
iv. RTU-12 and RTU-13 are 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 shut down frequently and need to be reset manually. We suspect that static pressure issues are present as a

result of undersized ductwork.

d. George Mason - Priority Level 2**, Potentially Critical**

   i. Sewage Ejector System is not Properly Sealed and Missing Pump. 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. This left the tank improperly sealed and allowed sewer odors into the space.
   ii. Plumbing Fixtures not Properly Physically Sized for Current Age Group,
   iii. Classroom unit ventilators are old and past their useful lifecycles. They are mainly controlled manually 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.

e. George Washington – Priority Level 1, **Currently Critical**

   i. Rooms A160 through A165 (Courtyard Classrooms) currently do not receive proper ventilation air and air circulation. The rooms are only cooled by local A/C units do not receive ventilation air from the air handling unit. In order to provide ventilation air in Classrooms A160 through A165, modify supply and return ductwork. Supply and return ductwork should be routed along the perimeter of the spaces to avoid impact on low ceilings.
   ii. Replace the air handling units (AHUs) that have reached or exceeded their expected useful life. This equipment has been identified to be replaced and is currently scheduled for replacement between 2020 and 2023. Depending on the ventilation airflow, and supply airflow required, an energy wheel may be required to meet current energy codes.
   iii. 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.
   iv. The broken sump pump in the south mechanical equipment room should be replaced. The new sump pump provided should match existing sump pump type/make.
   v. The boiler, which is not operational requires replacement.

f. Matthew Maury - Priority Level 2**, Potentially Critical**

   i. Provide Music room 12 with individual control damper for temperature adjustment and electric with electric heat/reheat.
   ii. Replace the existing plumbing fixtures with new code compliant fixtures to reduce water consumption.
   iii. Replace the existing water heaters and install on an elevated stand to keep them off of the floor.

B. SUMMARY OF RECOMMENDATIONS

Deficiency Priority 1 recommendations for all six facilities are listed below. (Please refer to *Section III,* *"Detailed Building and Deficiency Data"* for recommendations regarding Priority 2, 3, and 4 deficiencies in each facility).

Please be mindful when considering these numbers, that the Mount Vernon Community School, which was not included in our condition audits, also needs to be considered. Refer to Appendix D, *Mt. Vernon Community School Water Intrusion Assessment*.

- All buildings: Install carbon monoxide detection and warning equipment in spaces with fuel burning equipment and adjacent spaces where carbon monoxide can permeate through ceilings, floors, and walls.

- Cora Kelly:
    - Future replacement building: The building is located in a flood plain which makes the building more vulnerable to water and moisture infiltration. This condition creates the pressing need for future replacement in order to take the school away from the risk of failure due to flooding. The proposed new building must be located and sited to eliminate the vulnerability to flooding.
    - Roofing replacement - Replace all single-ply membrane roofs. Modify and renovate all roof drains, gutters and rain leaders. $1,140,000
    - Mitigate water issues under classroom 2 - Provide drainage and ventilation to reduce humidity issues under floor and in classroom. Tnemec rust inhibitor paint on existing trusses and steel. $10,000
    - Provide a single 3500lb hydraulic elevator in main lobby to second floor. $150,000
    - Reinsulate the existing exterior ducts on the roof. $75,000
    - Make corrections to ADA ramp slopes, width and railings at main entrance.

- Francis C. Hammond
    - Cafeteria HVAC Repair or Replacement to address heating issues in the cafeteria.
    - Site Hardscape Repair/Replacement to replace pole-mounted 400 W HPS Fixtures.
    - D-Wing Roof Repair or Replacement to replace D wing roofs with white EPDM Membrane roof.
    - Reconstruct toilet rooms in D-Wing - Reconstruct 2nd floor toilet rooms in D-Wing and spot repair and refinish 1st floor.
    - Repair and reconstruct floor slab at basement locker room corridor; provide floor drains and sump pump to alleviate future flooding.
    - Basement Flooding prevention: Alleviate basement flooding from exterior wall at Stair 9. install basement wall waterproofing and French drain. Install multiple sump pumps and drainage piping.
    - ACM Testing and mitigation - Ongoing testing and mitigation of ACM, mold and other hazardous materials.
    - Dust Collector Room - Evaluate and replace unsafe electrical distribution, address unsafe installation.
    - Replace or repair failed HVAC equipment: Chilled water pump and exhaust fan.
    - ADA access to building from Seminary - Provide an ADA compliant access point from Seminary Road to the school's main entrance.
    - Drainage improvements at courtyard - Address grading issues in enclosed courtyard.

Areas adjacent to the building should be graded to provide positive drainage away from the building.
    - Miscellaneous roof leader connections throughout - Provide hard piping of roof leaders in enclosed courtyard to storm structures to eliminate ponding and wet areas. At the southern courtyard, hard pipe the roof leaders on the bridge structure to the adjacent storm manhole. At the exterior of the entire building, connect roof leaders that are currently discharging on sidewalks, to a closed storm drainage system to prevent icing and water intrusion. Provide an additional drain at lower level of exposed staircase to alleviate existing flooding issues.

- George Mason
    - Construction of a new school with 700 student capacity. This building has expanded in a patch-work of renovations and expansion projects, over the years. The current building is undersized and equipped with out of date facilities. The study concurs with the direction of building a replacement facility and shows this as a priority. Several of the renovation measures below are still required to keep the facility operating and to prevent critical failure in the interim. It fully recognizes that interim renovations may not fully mature from a cost-benefit perspective.
    - Quarterly mold and indoor air quality testing.
    - Exterior envelope improvements - Roofing and gutters over historic building.
    - Water Remediation at Basement - Provide foundation water proofing and sump pumps at basement. Provide mold and ACM testing and mitigation. Focus attention on water removal around electrical equipment.
    - Replace existing duplex Sewage Ejector
    - Miscellaneous drainage repairs - Clean out and repair all inlets onsite; stabilize and repair areas of erosion; repair erosion channel that has formed in the northwest corner of the parking lot.
    - Miscellaneous drainage improvements - Remove excessive vegetation from around inlets within the discharge swale. Regrade the swale to promote positive drainage; Regrade field area to provide positive drainage and alleviate low spots; Provide inlet to receive drainage from parking lot adjacent to tennis courts; Provide inlet or regrade to alleviate ponding at low spot in the loading area; Provide positive drainage away from the building; Install a series of yard inlets to collect runoff on the west and north sides of the property. Provide positive drainage to the inlets; Set timber edging flush with grade on the mulch playgrounds. Provide yard inlets and positive drainage to them to alleviate playground flooding; Provide additional stormwater management facilities to collect and treat runoff and provide quantity and quality control; address infiltration under the playgrounds.

- George Washington
    - Replace HVAC equipment which has reached the end of its life-cycle.
    - Perform renovation work to 3rd floor classrooms including flooring.
    - Replace 40 HP, 500-gal fire pumps.
    - Replace HVAC system ductless miniplate.
    - Basement ACM and Mold Testing and mitigation and repainting.
    - New Safety ladders and roof hatches.
    - Provide ventilation air to Courtyard classrooms A160 thru A165 from existing air handling

units.
  - Replace existing chiller that is not operational.
  - Replace existing sump pump in the mechanical equipment room.
  - Replace the existing non-functioning boiler.
  - Storm drain cleaning: Clean inlet at the downstream end of Potomac Yard Park Ditch; Clean out grates in front of doors within the southern courtyard; Clean out drain at the bottom of the stairs along the south side of the building; Clean out the inlet in the front yard and front courtyard areas; Clean out drain at the bottom of stairs along the courtyard area north of the main entrance; Clean out all curb inlets.

- Matthew Maury
  - Roofing replacement - Replace all single ply roofing, reconstruct and extend gutters.
  - Music Room additional Damper and Heat - Provide additional control damper and reheat to Music Room 12.
  - Miscellaneous drainage maintenance – Clean out all inlets onsite; Clean out all trench drains; Clean out stormwater management facility riser structure and maintain facility
  - Miscellaneous drainage improvements and repairs - Repair/replace all inlets onsite; Regrade back driveway and courtyard to provide positive drainage to inlets from surface runoff and roof leaders. Provide additional inlets if invert allows; Repair damaged roof leaders all around building; Raise mulch elevation of playground to top of surrounding curb to provide positive drainage to the trench drain on the east side of the playground; Provide positive drainage to inlets in playground area; Consider infiltration under the playgrounds; Create positive drainage from roof leaders in the front of the building away from the building towards the Russell Road inlets. Provide yard inlets to collect drainage in the courtyard and front of the building if outfall into those right-of-way inlets is available; Provide positive drainage under foot bridge at the northeast corner of the site; Repair downspouts from rain barrels.

- Transportation Facility
  - Transportation Facility Modernization – The building is undersized and in very poor condition. A prior capital improvement program identified a budget of $6,710,000 for upgrades to the facility. The assessment team feels that this budget is inadequate to achieve the full expansion and modernization scope. Of additional note, the team recommends building a completely new facility. In this case, the budget summary recognizes the earlier approved amount of $6,710,000 and includes an additional budget of $7,600,000.
  - Roof Replacement - Replace standing seam roof with an insulated low slope multi-ply roof with reconfigured gutters.
  - Toilet room renovations and expansion - Expand and reconfigure toilet rooms with ADA compliant toilets that have fixtures that will meet the standard and the volume of need between shifts.
  - ACM and Mold testing
  - Garage Fume Extraction - Provide new vehicle fume extraction.
  - Provide replacement HVAC system.
  - Add emergency lighting unit in stairwell.

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. COSTS

- Rough order of magnitude estimates associated with each remediation project are indicated in the "*ACPS Targeted Condition Assessments – Planning Projections*" on the following pages.
- Please be mindful when considering these numbers, that the Mount Vernon Community School, which was not included in our condition audits, also needs to be considered. Refer to Appendix D, *Mt. Vernon Community School Water Intrusion Assessment*.

ACPS Targeted Condition Assessments - Planning Projections

Site	Facility Type	Program	Deficiency Priority	Program Details	Capacity/ Non-Capacity	Year	Budget
Cora Kelly	Elementary	Design, Project Management & Other Soft Costs	1	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	2026	6,045,458
Cora Kelly	Elementary	Construction of Renovation & Capacity	1	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	C	2027	30,227,289
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	Provide 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	Exterior duct insulation	1	Reinsulate 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
Francis C. Hammond	Secondary	HVAC Repair or Replacement	1	This project will address heating issues in the cafeteria.	N	2020	222,395
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	ACM Testing and mitigation	1	Ongoing testing and mitigation of ACM, mold and other hazardous materials	N	TBD	50,000
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
Francis C. Hammond	Secondary	ADA access to building from Seminary	1	Provide an ADA compliant access point from Seminary Road to the school's main entrance	N	TBD	5,000
Francis C. Hammond	Secondary	Drainage improvements at courtyard	1	Address grading issues in enclosed courtyard. Areas adjacent to the building should be graded to provide positive drainage away from the building.	N	TBD	50,000

Note: Red font indicates programs identified as a result of *Targeted Condition Assessments.*

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ACPS Targeted Condition Assessments - Planning Projections

Site	Facility Type	Program	Deficiency Priority	Program Details	Capacity/ Non-Capacity	Year	Budget
Francis C. Hammond	Secondary	Miscellaneous roof leader connections throughout	1	Provide hard piping of roof leaders in enclosed courtyard to storm structures to eliminate ponding and wet areas. At the southern courtyard, hard pipe the roof leaders on the bridge structure to the adjacent storm manhole. At the exterior of the entire building, connect roof leaders that are currently discharging on sidewalks, to a closed storm drainage system to prevent icing and water intrusion. Provide an additional drain at lower level of exposed staircase to alleviate existing flooding issues.	N	TBD	75,000
George Mason	Elementary	Design, Project Management & Other Soft Costs	1	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	2023	8,007,990
George Mason	Elementary	Construction of Renovation & Capacity	1	This includes hard costs associated with site work and construction of a new school with 700 student capacity.	C	2024	20,019,975
George Mason	Elementary	Mold testing	1	Quarterly mold and indoor air quality testing	N	TBD	25,000
George Mason	Elementary	Exterior envelope improvements	1	Roofing and gutters over historic building	N	TBD	200,000
George Mason	Elementary	Water Remediation at Basement	1	Provide foundation water proofing and sump pumps at basement. Provide mold and ACM 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 burning equipment spaces and adjacent space, and in communicating classrooms.	n	TBD	7,500
George Mason	Elementary	Miscellaneous drainage repairs	1	• Clean out and repair all inlets onsite • Stabilize and repair areas of erosion • Repair erosion channel that has formed in the northwest corner of the parking lot • Repair all roof leaders and provide positive drainage away from the building	N	TBD	25,000

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ACPS Targeted Condition Assessments - Planning Projections

Site	Facility Type	Program	Deficiency Priority	Program Details	Capacity/ Non-Capacity	Year	Budget
George Mason	Elementary	Miscellaneous drainage improvements	1	• Remove excessive vegetation from around inlets within the discharge swale. Regrade the swale to promote positive drainage • Regrade field area to provide positive drainage and alleviate low spots • Provide inlet to receive drainage from parking lot adjacent to tennis courts. Repair erosion channel that has formed in the northwest corner of the parking lot • Provide inlet or regrade to alleviate ponding at low spot in the loading area • Provide positive drainage away from the building • Install a series of yard inlets to collect runoff on the west and north sides of the property. Provide positive drainage to the inlets • Set timber edging flush with grade on the mulch playgrounds. Provide yard inlets and positive drainage to them to alleviate playground flooding • Provide additional stormwater management facilities to collect and treat runoff and provide quantity and quality control • Consider infiltration under the playgrounds	N	TBD	75,000
George Washington	Secondary	HVAC Repair or Replacement	1	This project will replace HVAC equipment which has reached the end of its life-cycle.	N	2020	152,403
George Washington	Secondary	Renovations & Reconfigurations	1	This project will perform renovation work to 3rd floor classrooms including flooring.	N	2021	558,000
George Washington	Secondary	HVAC Repair or Replacement	1	This project will replace HVAC equipment which has reached the end of its life-cycle.	N	2022	47,497
George Washington	Secondary	Fire Alarm System	1	This funding replaces fire pumps, 40 HP, 500-gal.	N	2023	54,379
George Washington	Secondary	HVAC Repair or Replacement	1	This project will replace HVAC equipment which has reached the end of its life-cycle.	N	2023	159,840
George Washington	Secondary	HVAC Repair or Replacement	1	This project will replace ductless miniplate.	N	2024	13,802
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 operational	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 non functioning boiler	N	TBD	
George Washington	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

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ACPS Targeted Condition Assessments - Planning Projections

Site	Facility Type	Program	Deficiency Priority	Program Details	Capacity/ Non-Capacity	Year	Budget
George Washington	Secondary	Storm drain cleaning	1	• Clean inlet at the downstream end of Potomac Yard Park Ditch • Clean out grates in front of doors within the southern courtyard • Clean out drain at the bottom of the stairs along the south side of the building • Clean out the inlet in the front yard and front courtyard areas • Clean out drain at the bottom of stairs along the courtyard area north of the main entrance • Clean out all curb inlets	N	TBD	10,000
George Washington	Secondary	Miscellaneous grading and drainage improvements at building	1	• Define swale and create positive drainage to inlet downstream of the southern courtyard area • Fix roof leaders and downspouts in courtyard areas • Create positive flow to the rain garden • Replace damaged inlet in courtyard area south of main entrance, lower grate top elevation • Create positive flow within the front yard area to the existing inlets • Create positive flow from condensation drains along all sides of the building • Lower grate top of inlet within courtyard north of the main entrance and regrade area for positive flow • Potentially create a series of drains to collect the front entrance area drainage to alleviate flooding of the walkways • Regrade north drive area to alleviate low spots and create positive flow • Use a series of yard inlets to collect drainage along the north side of the building to prevent ponding and water intrusion • Repair or replace damaged curb inlets within parking and paved areas. Clean out all curb inlets • Connect roof leader to header pipe along the east side/back of the building • Create positive flow to inlet in sidewalk areas of the entrance. Sod areas to alleviate erosion • Regrade areas of the parking lot to alleviate low points and create positive flow to the curb inlets • Replace existing pedestrian drain cover currently in a structurally deficient concrete slab adjacent to an ingress/egress doorway in the interior courtyard	N	TBD	175,000
Matthew Maury	Elementary	Roofing replacement	1	Replace all single ply roofing and reconstruct and extend gutters	N	TBD	950,000
Matthew Maury	Elementary	Music Room additional Damper and Heat	1	Provide additional 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 burning equipment spaces and adjacent space, and in communicating classrooms.	N	TBD	7,500
Matthew Maury	Elementary	Miscellaneous drainage maintenance	1	• Cleanout all inlets onsite • Cleanout all trench drains • Cleanout stormwater management facility riser structure and maintain facility	N	TBD	10,000

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ACPS Targeted Condition Assessments - Planning Projections

Site	Facility Type	Program	Deficiency Priority	Program Details	Capacity/ Non-Capacity	Year	Budget
Matthew Maury	Elementary	Miscellaneous drainage improvements and repairs	1	• Repair/replace all inlets onsite • Regrade back driveway and courtyard to provide positive drainage to inlets from surface runoff and roof leaders. Provide additional inlets if invert allows • Repair damaged roof leaders all around building • Raise mulch elevation of playground to top of surrounding curb to provide positive drainage to the trench drain on the east side of the playground • Provide positive drainage to inlets in playground area • Consider infiltration under the playgrounds • Create positive drainage from roof leaders in the front of the building away from the building towards the Russell Road inlets. Provide yard inlets to collect drainage in the courtyard and front of the building if outfall into those right-of-way inlets is available • Provide positive drainage under foot bridge at the northeast corner of the site • Repair downspouts from rain barrels	N	TBD	25,000
Transportation Services	Other	Transportation Facility Modernization	1	This project includes an upgrade of the existing facility to modernize and meet capacity needs, pending the Witter Wheeler Campus Study	C	2022	6,710,000
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	These are the funds to build a completely new facility	C	TBD	7,600,000
Transportation Services	Other	Roof Replacement	1	Replace standing seam roof with an insulated low slope 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
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
Cora Kelly	Elementary	Kitchen/ Cafeteria renovation and reconfigurations	2	This project funds contingency for kitchen upgrades as recommended in the B&D assessment and funded in FY 2019.	N	2020	75,515
Cora Kelly	Elementary	Flooring Repair/Replace	2	This project will replace carpet.	N	2020	400,000
Cora Kelly	Elementary	ADA access at main entrance	2	Make corrections to ramp slopes, width and railings	N	TBD	25,000
Cora Kelly	Elementary	Partial Window replacement	2	Replace 30 windows and sills and provide caulking	N	TBD	60,000

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ACPS Targeted Condition Assessments - Planning Projections

Site	Facility Type	Program	Deficiency Priority	Program Details	Capacity/ Non-Capacity	Year	Budget
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	Fire Alarm & Voice Evacuation System	2	Replace fire alarm system	N	TBD	210,000
Cora Kelly	Elementary	Emergency and Exit Lighting	2	Evaluate existing system adequacy and provide supplemental emergency lighting units	N	TBD	75,000
Cora Kelly	Elementary	ADA parking	2	Make corrections to signage, slopes, and obstructions at ADA parking stalls	N	TBD	15,000
Cora Kelly	Elementary	ADA route to road	2	Make corrections to ramp slopes.	N	TBD	5,000
Cora Kelly	Elementary	ADA in courtyard	2	Provide ADA compliant access and ADA compliant seating	N	TBD	10,000
Cora Kelly	Elementary	Drainage improvements	2	Regrade front swale, repair and stabilize areas of erosion, provide inlets at the back of school for drainage collection,construct stormwater management facility at back of school, provide inlets for runoff collection around playgrounds and repair erosion. Regrade the courtyard area to provide positive drainage.	N	TBD	50,000
Francis C. Hammond	Secondary	HVAC Repair or Replacement	2	This project will replace HVAC equipment which has reached the end of its life-cycle.	N	2021	186,696
Francis C. Hammond	Secondary	HVAC Repair or Replacement	2	This project will replace HVAC equipment which has reached the end of its life-cycle.	N	2022	189,555
Francis C. Hammond	Secondary	Storm water management	2	This project funds major maintenance required on the tree box filter BMP.	N	2022	60,000
Francis C. Hammond	Secondary	Roof Repair or Replacement	2	This project will replace single ply SCO White EPDM Membrane roof.	N	2024	873,758
Francis C. Hammond	Secondary	Site Hardscape Repair/Replacement	2	This project replaces pole-mounted light 400 W HPS Fixture.	N	2020	18,626
Francis C. Hammond	Secondary	Renovations & Reconfigurations	2	This project will repair leaking windows in the cafeteria.	N	2020	40,000
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	Finishes renovations	2	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	Emergency and Exit Lighting	2	Evaluate existing system adequacy and provide supplemental emergency lighting units	N	TBD	200,000
Francis C. Hammond	Secondary	Reconstruction of ADA parking	2	Replace the existing ADA parking areas in all parking lots with compliant paving and compliant signage. Provide an ADA compliant route from each ADA parking area into the adjacent building entrance. Correct ADA accessible ramp on north side of school which is non-compliant.	N	TBD	50,000

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ACPS Targeted Condition Assessments - Planning Projections

Site	Facility Type	Program	Deficiency Priority	Program Details	Capacity/ Non-Capacity	Year	Budget
Francis C. Hammond	Secondary	ADA access to roller hockey and grass field	2	Provide an ADA compliant route from the parking area near the roller hockey rink to the grass playing fields on the north side of campus.	N	TBD	40,000
Francis C. Hammond	Secondary	ADA improvements at courtyard	2	Provide ADA access to the learning spaces in the enclosed courtyard from one or more doors. Provide ADA compliant areas at each distinct learning space in the courtyard.	N	TBD	25,000
Francis C. Hammond	Secondary	Railing at retaining wall	2	Provide safety railing at retaining wall near loading area on west side of the building	N	TBD	2,500
George Mason	Elementary	Masonry repointing	2	Repoint masonry at selected locations	N	TBD	50,000
George Mason	Elementary	Closet door replacement	2	Replace closet doors in classrooms	N	TBD	60,000
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
George Mason	Elementary	Concrete steps replacement/repair (where possible)	2	Patch or replace existing concrete steps that are cracked, missing chunks of concrete, and have significant surface and riser nosing wear from age.	N	TBD	10,000
George Mason	Elementary	Slate/stone paver landing removal/replacement	2	Remove and replace cracking and broken slate/stone pavers at landings of steps with concrete landings or new stone pavers with a level and gap-free surface.	N	TBD	$5,000 ($3,000 replacement w/concrete)
George Mason	Elementary	ADA parking and access reconstruction	2	Replace the existing ADA parking areas with compliant paving and compliant signage. Provide an ADA compliant route from ADA parking spaces into the adjacent building entrance.	N	TBD	25,000
George Mason	Elementary	Replace exterior ramps	2	Replace the existing non-compliant ramps on the exterior of the building.	N	TBD	40,000
George Mason	Elementary	Provide ADA route from road	2	Provide an ADA compliant access point from the road to the school's main entrance.	N	TBD	40,000
George Washington	Secondary	Renovations & Reconfigurations	2	This project will perform renovation work to 2nd floor classrooms including flooring.	N	2020	650,000
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
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
George Washington	Secondary	Concrete sidewalk panel replacements	2	Replace cracked/damaged concrete sidewalk panels along pedestrian walkways and within the interior courtyard.	N	TBD	20,000
George Washington	Secondary	Concrete steps replacement/repair (where possible)	2	Patch or replace existing concrete steps that are cracked, missing chunks of concrete, and have significant surface and riser nosing wear from age.	N	TBD	10,000

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Site	Facility Type	Program	Deficiency Priority	Program Details	Capacity/ Non-Capacity	Year	Budget
George Washington	Secondary	ADA parking and access to building reconstruction	2	Reconstruct the ADA parking spaces in the main parking lot to be compliant with regards to slope, size, signage and access to the building. Provide ADA access into the building from all ADA parking stalls.	N	TBD	150,000
George Washington	Secondary	ADA Access to Glendale	2	Replace the curb ramps from E. Glendale Ave into the site to provide an ADA compliant route to a public right of way.	N	TBD	5,000
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
Matthew Maury	Elementary	Concrete steps replacement/repair (where possible)	2	o Patch or replace existing concrete steps that are cracked, missing chunks of concrete, and have significant surface and riser nosing wear from age. o Re-apply non-slip/sealant coating to masonry steps at the main front entrance of the school.	N	TBD	10,000
Matthew Maury	Elementary	ADA access from the road	2	Replace the sidewalk coming from the street up to the site on the southern end of the building with an ADA compliant section of sidewalk.	N	TBD	5,000
Matthew Maury	Elementary	ADA parking	2	• Provide ADA compliant parking stalls that include appropriate signage, slopes, and size. • Provide an accessible route into the building from the ADA parking stalls	N	TBD	25,000
Transportation Services	Other	Foundation/ Basement wall	2	Excavate and install waterproofing, foundation drainage and repair and seal wall cracks	N	TBD	300,000

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Site	Facility Type	Program	Deficiency Priority	Program Details	Capacity/ Non-Capacity	Year	Budget
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
Transportation Services	Other	ADA compliant parking and access to building	2	• Install new ADA compliant parking spaces in the passenger vehicle parking lot on the north side of the building. • Install a new ADA compliant access route into the building from the ADA parking stalls. • Construct a new ADA compliant access path into the building from a public right-of-way into one of the building entrances	N	TBD	50,000
Transportation Services	Other	Replacement of stair railing	2	Replace noncompilant stair railing for the exterior concrete stairs on the north side of the building.	N	TBD	5,000
Cora Kelly	Elementary	ACM testing and mitigation	3	Ongoing testing of materials uncovered during renovations that may have asbestos or other hazardos materials requiring mitigation	N	TBD	50,000
Cora Kelly	Elementary	Toilet rooms	3	Remodel boys and girls room on second floor	N	TBD	150,000
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	Relocate 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
Cora Kelly	Elementary	Concrete sidewalk panel replacements	3	Replace cracked/damaged concrete sidewalk panels along pedestrian walkways.	N	TBD	10,000
Cora Kelly	Elementary	Miscellaneous maintenance and grading	3	Clean out curb inlets along front parking area and provide positive drainage into drainage swale. Cleanout excessive vegetation in drainage swale and provide positive outfall.	N	TBD	10,000
Cora Kelly	Elementary	ADA improvements at playground	3	Provide ADA compliant access to playground from school and parking lot	N	TBD	20,000
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
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	Panelboard	3	Replace obsolete panelboards	N	TBD	56,000
Francis C. Hammond	Secondary	Paving repairs at roller hockey parking	3	Replace failed pavement in and around the roller hockey rink	N	TBD	100,000
Francis C. Hammond	Secondary	Gym/tennis ADA access	3	Provide ADA access to the gymnasium and tennis courts from the parking area.	N	TBD	75,000
George Mason	Elementary	ACM Mitigation	3	Test and mitigate ACM in areas where floors are renovated and materials are exposed	N	TBD	35,000

Note: Red font indicates programs identified as a result of *Targeted Condition Assessments.*

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ACPS Targeted Condition Assessments - Planning Projections

Site	Facility Type	Program	Deficiency Priority	Program Details	Capacity/ Non-Capacity	Year	Budget
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	Renovate 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 panelboard in boiler room	N	TBD	32,000
George Mason	Elementary	Asphalt pavement repair/replacement	3	Repair/replace asphalt paving at the rear loading/parking area and large area located within the rear paved access road. All areas with subgrade failure and major pavement deterioration shall receive full-depth asphalt pavement replacement. All areas exhibiting minor surface cracks and missing/damaged surface pavement shall be milled and overlaid.	N	TBD	20,000
George Mason	Elementary	Concrete sidewalk panel replacements	3	Replace cracked/damaged concrete sidewalk panels along pedestrian walkways.	N	TBD	3,000
George Mason	Elementary	Additional stone aggregate for walkways	3	Replace the stone aggregate that has washed out from the walkways on the school grounds to provide an even walking surface throughout and to be flush with existing manholes and appurtenances within the walkway. Additionally, we recommend that the entire length of the stone aggregate walkway have an edging installed on the downhill edge of the walkway path to avoid future washout and depletion of walkway stone aggregate.	N	TBD	10,000
George Mason	Elementary	Provide ADA route to playground and ballfield	3	Provide an ADA compliant route from the building to the play areas and playground. Provide an ADA compliant route to one of the ballfields.	N	TBD	15,000
George Washington	Secondary	Interior/Exterior Painting	3	This project will perform life-cycle painting.	N	2024	296,665
George Washington	Secondary	Exterior Windows	3	Replacement of Historic windows along western façade of Building A	N	TBD	400,000
George Washington	Secondary	Access to bleachers and tennis courts	3	Provide an ADA accessible route from the ADA parking stalls to the bleachers and the tennis courts	N	TBD	20,000
George Washington	Secondary	Southern parking ADA spaces	3	Provide access to the building from the southern ADA parking spaces. Add compliant signage to the ADA spaces at the southern parking lot as well as compliant striping.	N	TBD	5,000
George Washington	Secondary	ADA ball field access to south	3	Provide ADA access to the ball fields to the south of the parking lot.	N	TBD	25,000
George Washington	Secondary	ADA Access to community garden	3	Provide access to the community gardens via an ADA compliant route from the building and provide for an appropriate percent of garden beds to be accessible.	N	TBD	50,000
Matthew Maury	Elementary	Interior/Exterior Painting	3	This project will perform life-cycle painting.	N	2024	206,055
Matthew Maury	Elementary	Chair lift	3	Provide chairlift at new classrooms in repurposed stage	N	TBD	25,000

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ACPS Targeted Condition Assessments - Planning Projections

Site	Facility Type	Program	Deficiency Priority	Program Details	Capacity/ Non-Capacity	Year	Budget
Matthew Maury	Elementary	Storm water rerouting	3	Reroute storm leaders to underground pipoing and divert away from building to public storm system	N	TBD	100,000
Matthew Maury	Elementary	Replace closet doors	3	Replace closet doors in classrooms	N	TBD	60,000
Matthew Maury	Elementary	Gas Piping Supports	3	Replace natural gas piping supports on roof	N	TBD	7,500
Matthew Maury	Elementary	Concrete sidewalk panel replacements	3	Replace cracked/damaged concrete sidewalk panels along pedestrian walkways.	N	TBD	5,000
Matthew Maury	Elementary	Additional stone aggregate for walkways	3	Replace the stone aggregate that has washed out from the walkways on the school grounds to provide an even walking surface throughout and to be flush with existing manholes and appurtenances within the walkway. Install edging for the entire length of the stone aggregate walkway on the downhill edge of the walkway path to avoid future washout and depletion of walkway stone aggregate.	N	TBD	15,000
Matthew Maury	Elementary	ADA access to fenced play area	3	Provide ADA compliant access to the fenced in grass play area from the building and provide ADA compliant seating spaces at the tables. (The play equipment did not have an ADA accessible route due to the displacement of the engineered wood fiber safety surfacing).	N	TBD	5,000
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
Transportation Services	Other	Mill/overlay of bus parking	3	Mill and overlay the bus parking lot on the west side of the parking lot to extend the life of the current asphalt paving	N	TBD	100,000
Transportation Services	Other	Repaint/overlay of south parking	3	Provide localized full depth patch of the parking lot on the southern side of the building and mill and overlay of the entire parking lot.	N	TBD	100,000
Transportation Services	Other	Mill/overlay of fueling station paving	3	Provide localized full depth patch of the fueling station asphalt paving and mill and overlay of the entire asphalt paved area to extend the life of the existing paving section.	N	TBD	50,000
Cora Kelly	Elementary	Site Hardscape Repair/Replacement	4	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.	N	2020	60,000
Cora Kelly	Elementary	Full window replacement	4	Replace all windows and sills with caulking	N	TBD	500,000
Cora Kelly	Elementary	Renovate entry storefront	4	Replace doors and storefront glass at entries	N	TBD	100,000
Cora Kelly	Elementary	Wall refinishing	4	Replace concrete backer board panels, prep an repaint	N	TBD	200,000
Cora Kelly	Elementary	Wall and ceiling refinishing	4	Repaint walls and replace damaged ceilings	N	TBD	100,000
Cora Kelly	Elementary	Preventive Maintenance	4	Implement preventive maintenance program - annual	N	TBD	10,000
Cora Kelly	Elementary	Fire Alarm & Voice Evacuation System	2	Replace fire alarm system	N	TBD	210,000

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ACPS Targeted Condition Assessments - Planning Projections

Site	Facility Type	Program	Deficiency Priority	Program Details	Capacity/ Non-Capacity	Year	Budget
Cora Kelly	Elementary	Asphalt pavement repair/replacement	4	Repair/replace asphalt pavement in the front parking area/bus loop, the asphalt hardscape play area, the large areas located within the parking lot near the entrances and drop off area, and the entire rear access drive and basketball court. (Mill and overlay cracked asphalt hardscape play area, replace basketball court pavement).	N	TBD	80,000
Cora Kelly	Elementary	Pavement restriping	4	Replace all missing or faded striping.	N	TBD	15,000
Cora Kelly	Elementary	Pervious pavement walkway replacement	4	Replace entire pervious pavement walkway around the perimeter of the existing playground.	N	TBD	50,000
Francis C. Hammond	Secondary	Exterior Playgrounds or Sports Areas	4	This project will upgrade the existing tennis courts to a multi-use grid court.	N	2020	380,000
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
Francis C. Hammond	Secondary	Paving repairs at northern lot	4	Mill and overlay the northern parking lot and drive aisle.	N	TBD	25,000
Francis C. Hammond	Secondary	Paving repairs at western parking lot	4	Provide full depth repairs of minor areas and mill and overlay of entire western parking lot adjacent to the gymnasium.	N	TBD	75,000
Francis C. Hammond	Secondary	Tennis court replacement	4	Replace the tennis court paving which has failed.	N	TBD	75,000
Francis C. Hammond	Secondary	Erosion repair	4	Stabilize mild erosion on the west side of the tennis courts.	N	TBD	2,500
George Mason	Elementary	Library carpeting	4	Replace library carpeting	N	TBD	15,000
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
George Mason	Elementary	Pavement restriping	4	All missing or faded striping and markings in parking lot and loading area should be replaced.	N	TBD	5,000
George Mason	Elementary	Concrete/asphalt curbing replacements	4	Replace damaged asphalt and concrete curbing around parking and loading areas.	N	TBD	10,000
George Mason	Elementary	Heavy-duty concrete dumpster pad	4	Install a heavy-duty concrete dumpster pad at the one trash enclosure at the rear end of the parking lot.	N	TBD	3,000
George Mason	Elementary	Colored asphalt hardscape crack seal w/minor repainting	4	Perform minor crack sealing and painting of chipped colored asphalt hardscape play area.	N	TBD	3,000
George Mason	Elementary	Rubber play surfacing replacement w/minor subgrade amendments	4	Remove and replace the entire rubber play surfacing around the playground equipment.	N	TBD	30,000
George Washington	Secondary	Exterior Playgrounds or Sports Areas	4	This project includes track & field improvements.	N	2022	2,500,000
George Washington	Secondary	Exterior Playgrounds or Sports Areas	4	This project will improve exterior playgrounds/sports areas.	N	2026	15,000
George Washington	Secondary	Exterior Playgrounds or Sports Areas	4	This project includes improvements to Braddock field.	N	2026	371,000
George Washington	Secondary	Exterior Masonry Repointing	4	Select Repointing of exterior masonry	N	TBD	150,000

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ACPS Targeted Condition Assessments - Planning Projections

Site	Facility Type	Program	Deficiency Priority	Program Details	Capacity/ Non-Capacity	Year	Budget
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
George Washington	Secondary	Asphalt pavement repair/replacement	4	Repair and replace asphalt pavement for drive aisles of the parking lot, the bus pick-up and drop-off loop, the access drive to the athletic field at the east of the site, and the north entrance roadway to the drop-off loop.	N	TBD	100,000
George Washington	Secondary	Pavement restriping	4	All missing or faded striping should be replaced.	N	TBD	20,000
George Washington	Secondary	Concrete curbing replacement	4	Replace concrete curbing along the perimeter of the parking area	N	TBD	10,000
George Washington	Secondary	Playground safety surface maintenance/repair	4	Clean and perform manufacturer's recommended maintenance of existing rubber play surfacing at the two playground locations to provide safe and clean play surfaces while extending the life of the surfacing.	N	TBD	5,000
George Washington	Secondary	Ballfield regrading/erosion at ballfields	4	• Fix curb inlet in south parking area adjacent to ballfield • Fix erosion issues along Potomac Yard Park ditch • Regrade ballfield areas for positive drainage and fix low spots • Replace manhole lid with inlet lid to collect drainage from the low spot and the ballfield adjacent to the intersection of Mt. Vernon Avenue and E. Braddock Road • Put manhole lid cover back on manhole immediately adjacent to manhole that is suggested to be replaced with inlet cover near southern ballfield • Repair areas of erosion around fields	N	TBD	50,000
George Washington	Secondary	Drainage at rectangular fields	4	• Fix curb inlet in south parking area adjacent to ballfield • Clean inlet at the downstream end of Potomac Yard Park Ditch • Regrade ballfield areas for positive drainage and fix low spots • Replace manhole lid with inlet lid to collect drainage from the low spot and the ballfield adjacent to the intersection of Mt. Vernon Avenue and E. Braddock Road • Put manhole lid cover back on manhole immediately adjacent to manhole that is suggested to be replaced with inlet cover near southern ballfield • Install storm drainage around rectangular fields and tennis courts to alleviate ponding	N	TBD	75,000
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

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ACPS Targeted Condition Assessments - Planning Projections

Site	Facility Type	Program	Deficiency Priority	Program Details	Capacity/ Non-Capacity	Year	Budget
Matthew Maury	Elementary	Asphalt pavement repair/replacement	4	Repair/replace asphalt pavement at rear loading/parking area, access road, and drive aisle. Also replace a small area of asphalt pavement missing within the hardscape play area around an existing manhole (potential tripping hazard).	N	TBD	20,000
Matthew Maury	Elementary	Pavement restriping	4	All missing or faded striping should be replaced.	N	TBD	3,000
Matthew Maury	Elementary	Miscellaneous erosion mitigation	4	• Repair and stabilize areas of erosion • Provide stabilization around playground	N	TBD	5,000
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

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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:

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

The goal of this project is to assist ACPS in gathering detailed information on these 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 5, 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.

Clark | Azar & Associates, Inc. visited each site to conduct a survey of the existing exterior conditions of the grounds. The consultant utilized available GIS data and imagery provided by the City of Alexandria as well as limited plans from ACPS to assist with the site survey. Visual inspection supplemented with physical measurements of existing site pavement, drainage, transportation infrastructure, and ADA accessibility to the school was performed during the survey.

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 the 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

The following chapters for each facility provide details on building deficiencies that are in need of remediation.

IIIA- DETAILED BUILDING AND DEFICIENCY DATA

CORA KELLY - GENERAL

A. 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 "RECOMMENDATIONS".

B. SUMMARY OF FINDINGS

The surveys resulted in discovery of numerous issues and concerns contributing to unsatisfactory conditions within the building. Refer to "DETAILED FINDINGS" for further descriptions. 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, 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 damns 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.

Additionally, the site survey resulted in discovery of numerous issues and concerns contributing to unsatisfactory conditions on the exterior of the building. In summary, the following issues were discovered:

- The pavement in the main parking lot at the front of the school shows minor surface cracking and surface pavement that has been damaged/removed.
- A few large areas of the parking lot exhibit subgrade failure and significant pavement deterioration (specifically in the drop-off area and at the entrances/exits to the parking lot).
- The asphalt vehicle access drive along the rear of the school building has failed almost completely throughout.
- There are sections of the existing concrete curb and gutter around the perimeter of the parking lot that are broken apart, cracked, or missing.
- The existing striping in the parking lot is faded and, in some areas, no longer visible.
- An existing speed hump in the parking lot extends into one side of the parking bay.
- All of the existing concrete curb flumes in the parking lot area (4) are severely damaged and/or filled with asphalt surface material.
- A majority of the concrete sidewalks around the school are in acceptable condition, with a few panels throughout that are cracked or have deteriorating surfaces and joints.
- The asphalt hard surface play area at the rear of the school displays minor surface cracks and the play striping has faded and is no longer visible.
- The basketball court pavement at the rear of the school has failed and displays significant cracks throughout.
- Almost the entire length of the pervious walkway pavement loop around the playground displays subgrade failure and rutting, along with numerous areas of torn-up pavement and cracks.
- A few concrete steps to access points around the building have cracks, worn riser nosing, or chunks of concrete missing.
- The painted asphalt play area displays very minor surface cracks.

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.
- Perform the proposed site repairs in two phases to address the most pressing deficiencies immediately within the scope of Phase 1 including site repairs relating to pedestrian walkway pavement, ADA, and drainage deficiencies. The scope of Phase 2 shall include vehicular pavement repairs and maintenance that do not require immediate attention for the functionality of the school.

- Phase 1: We recommend performing all pedestrian access pavement/playground and athletic court pavement repairs/replacements (Civil) with the following scope:
    - Mill and overlay cracked asphalt hardscape play area and restripe for use at recess.
    - Entire existing basketball pavement shall receive full-depth asphalt pavement replacement.
    - Replace entire pervious pavement walkway around the perimeter of the existing playground.
    - Replace cracked/damaged concrete sidewalk panels along pedestrian walkways.
    - Patch or replace existing concrete steps that are cracked, missing chunks of concrete, and have significant surface and riser nosing wear from age.
- Phase 2: We recommend performing all vehicular pavement and curbing repairs/replacements (Civil) with the following scope:
    - All areas with subgrade failure and major pavement deterioration shall receive full-depth asphalt pavement replacement.
    - All areas exhibiting minor surface cracks and missing/damaged surface pavement shall be milled and overlaid.
    - All missing or faded striping should be replaced.
    - Remove existing portion of speed hump extending into the parking bay.
    - Seal minor surface cracks present on the colored asphalt play area.

D. COSTS

Refer to Section I-D “ACPS Targeted Condition Assessments – Planning Projections” for rough order of magnitude estimates associated with each remediation project identified.

CORA KELLY – DETAILED FINDINGS

A. 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 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 are in need of minor millwork repairs on the plastic laminate. More durable and lasting materials and impact resistant details for edges should be considered (Figure 7).

B. MECHANICAL, PLUMBING AND FIRE PROTECTION

a. HVAC Systems

The schools 14 packaged rooftop units, 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 resulting in 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. Portable heaters have been brought in as a supplemental heating source. Duct mounted heaters should be added to the branch ducts serving these rooms instead of the portable heaters.

b. Plumbing Systems

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 damns which prevent the water from getting to the drains. Some of the construction debris include 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. Numerous urinals have broken support tabs so the urinals are pulling away from the walls. The fixtures are also do not meet current standards for water consumption. Replacing them with new fixtures would greatly reduce the building's 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.

C. ELECTRICAL

Electrical service to the building is rated at 1600A, 480Y/277V, 3-phase, 4-wires. The service rating appears to be 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 has a remaining useful life expectancy of 8-10 years. However, well maintained equipment can continue to provide reliable service well beyond its average useful life. It is highly recommended that a routine, preventive maintenance plan be put in place and implemented.

The building does not have an emergency generator. Exit signs and emergency lighting are powered by batteries during power failures.

- Means of egress lighting in the building is provided by emergency battery pack lighting units. Based on the 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 the minimum required illumination levels during power outage. It is recommended that a study of the existing system be performed and that additional emergency lighting units be installed to meet minimum means of egress illumination levels.
- Recessed panelboards installed in the hallways exceed the maximum mounting height limitation of NFPA 70. The operating handle of the highest device (breaker) must not be more than 6'-7" above work platform or finished floor.
- It appears that a temporary power feed was installed to serve modular classrooms that were located in the parking lot. The modular classrooms have since been removed and the associated feeder was 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 continuously with no-load losses and 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.

- Cafeteria service counter has an open floor outlet. The outlet is missing a cover plate, exposing live conductors and creating a fire and life safety hazard.

D. FIRE ALARM

The building has a conventional Honeywell DeltaNet fire alarm and detection system. This system is obsolete and has served beyond its useful life expectancy. Fire alarm system notification devices in the original school building consist of horns and bells only. Horns and visual notification strobes have been provided in the corridors and classrooms of the new classroom wing that was constructed in 2005.

With the exception of the 2005 classroom wing, the system is not ADA compliant. Existing manual pull stations mounted in corridors are located just above the glazed CMU. They are mounted above the 54-inch maximum height imitation to handle from finish floor level, so they are not compliant with mounting heights required by NFPA 72 and ADA. Notification appliances are not located in classrooms and toilet rooms. Of additional note, locations of visible notification appliances in corridors are not in compliance with NFPA 72 and ADA.

The building is not fully sprinklered. The sprinkler protection is provided in the new classroom wing only. The non-sprinklered areas of the building lack required smoke detection throughout. Some smoke detectors are provided in corridors for the release of magnetically held doors.

We recommend replacing the entire facility fire alarm system with a new, addressable, fire detection and alarm system with, smoke detectors, ADA compliant visual notification strobes, and emergency voice communications 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.

E. STRUCTURAL

Refer to Supplemental Information, this chapter, for detailed discussion on findings.

F. CIVIL

a. PAVEMENT

The school grounds consist of one main parking lot at the front of the school, various pedestrian access walkways around the building, a paved access drive at the rear of the school, a pervious pavement walkway around an existing playground, and various paved hardscape play areas. (Refer to “Supplemental Information”, this chapter, for Exhibit A).

A majority of the asphalt pavement within the front parking area/bus loop, as well as the asphalt hardscape play area, displayed a sporadic distribution of surface cracking with isolated areas throughout exhibiting subgrade/pavement failure (Figure 16). These locations are indicated by △1 in Exhibit A. Additionally, there are large areas located within the parking lot (particularly near the entrances and drop off area) as well as the entire rear access drive and basketball court that are showing signs of subgrade failure and substantial pavement degradation (Figure 17/Figure 20). These areas are indicated as △2 in Exhibit A. There is an existing speed hump that partially extends into the parking bay (Figure 16) and is indicated as △8 in Exhibit A. The existing colored asphalt hardscape play area had very minimal cracking and is indicated as △3 in Exhibit A.

The concrete curbing along the perimeter of the parking area has a few spans throughout that are damaged or missing (Figure 18) and are indicated as △7 in Exhibit A. The (4) existing curb flumes along the parking lot display major damage and clogging with pavement debris (Figure 18) and are indicated as △9 in Exhibit A.

Much of the concrete sidewalks and access walkways around the exterior of the building were in fair condition, with a few sidewalk panels that were cracked or had deteriorating joints (Figure 19). The various locations are shown as △6 in Exhibit A. A few of the existing concrete steps at access points to the building showed signs of deterioration from age, cracks, and riser nosing chips (Figure 19). These locations are shown as △4 in Exhibit A.

The entire pervious pavement walkway surrounding the existing playground area shows signs of subgrade failure including rutting and localized depressions, as well as major cracks, heaving, and areas of exposed base stone within the walkway limits (Figure 21). This is indicated as △5 in Exhibit A.

b. ACCESSIBILITY

There are little to no access routes to the building or the site which are compliant with the requirements of the Americans with Disabilities Act (ADA).

- Access to the main entrance of the school does not meet ADA requirements. The ramp slopes, width and railings are not compliant.
- The ADA parking stalls near the front entrance are not compliant in signage, slopes and obstructions and the route to the main entrance from the parking stalls is not fully compliant.
- The access to the building from the road is not fully compliant. The ramps are out of tolerance with slopes.
- The ramp at the northern end of the school is not ADA compliant due to excessive slopes and non-compliant railings.

- The outdoor learning space in the courtyard does not have ADA compliant access or ADA compliant seating.
- The parking lot near the playground at the west side of the building does not have ADA compliant parking spaces. All parking lots should have required number of ADA spaces.
- The playground does not have ADA compliant access from the school or the parking lot. The existing ramps at the west side of the property does not meet slope requirements or have complaint handrails or landings.
- The play equipment does not appear to fully meet ADA compliance. There are no swings for children with disabilities. The climbing structures did not appear to have ramps or transfer seats to allow universal access to an appropriate number of activities.

c. DRAINAGE

There is limited storm drainage and minimal stormwater management on this site. There appear to be no inlets to receive drainage from the site. The roof appears to drain via drains within the building that tie in underground. The courtyard area needs to be regraded to provide positive drainage. There are no visible roof leaders. The site appears to have two drainage areas:

1. Commonwealth Avenue Drainage Area

   The front (east) side of the site sheet flows to a drainage ditch via curb flumes which appear to outfall to a drainage ditch on the opposite side of Commonwealth Drive. There are low points within the bus drop off area that do not have positive flow, these areas likely become icy in the winter. There is a second swale that receives drainage from the frontage that discharges to a culvert and then discharges across Commonwealth Avenue.

2. Wooded Area/Field Drainage Area

   The back (west) side of the school does not appear to have any inlets or stormwater management. The entire back of the school appears to sheet flow to the field and wooded areas to the far west of the property. There are a significant number of low spots that collect water before spilling over into the field areas. There is not positive outfall from the fields area to any apparent drainage system. It is likely that the playground and field areas pond water for a significant amount of time after rainfall. There are areas of erosion as well.

CORA KELLY - 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 system 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 the 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 2027 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 will be overcome by the introduction of an entirely 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 has 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 associated 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-classroom 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:

- 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:

- 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

a. PAVEMENT

- We recommend performing all pedestrian access pavement/playground and athletic court pavement repairs/replacements during Phase 1 (Civil) with the following scope:

    - Priority 4: Mill and overlay cracked asphalt hardscape play area and restripe for use at recess.
    - Priority 4: Entire existing basketball pavement shall receive full-depth asphalt pavement replacement.
    - Priority 4: Replace entire pervious pavement walkway around the perimeter of the existing playground.
    - Priority 3: Replace cracked/damaged concrete sidewalk panels along pedestrian walkways.
    - Priority 2: Patch or replace existing concrete steps that are cracked, missing chunks of concrete, and have significant surface and riser nosing wear from age.
- Priority 4: We recommend performing all vehicular pavement and curbing repairs/replacements during Phase 2 (Civil) with the following scope:
    - All areas with subgrade failure and major pavement deterioration shall receive full-depth asphalt pavement replacement.
    - All areas exhibiting minor surface cracks and missing/damaged surface pavement shall be milled and overlaid.
    - All missing or faded striping should be replaced.
    - Remove existing portion of speed hump extending into the parking bay.
- Priority 4: We recommend performing crack sealing of the minor surface cracks present on the colored asphalt play area during Phase 2 (Civil).

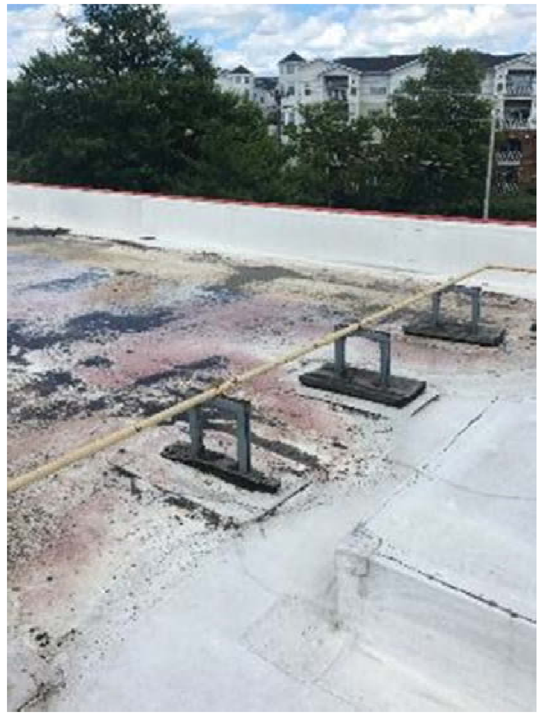
b. ACCESSIBILITY

- Priority 1: Access to the main entrance of the school does not meet ADA requirements. The ramp slopes, width and railings are not compliant.
- Priority 2: The ADA parking stalls are not compliant in signage, slopes and obstructions.
- Priority 2: The access to the building from the road is not fully compliant. The ramps are out of tolerance with slopes.
- Priority 2: The ramp at the northern end of the school is not ADA compliant due to excessive slopes and non-compliant railings.
- Priority 2: The outdoor learning space in the courtyard does not have ADA compliant access or ADA compliant seating.
- Priority 2: The parking lot near the playground at the west side of the building does not have ADA compliant parking spaces.
- Priority 3: The playground does not have ADA compliant access from the school or the parking lot.
- Priority 3: The play equipment does not appear to fully meet ADA compliance.

c. DRAINAGE

- Priority 3: Clean out curb inlets along front parking area and provide positive drainage into drainage swale.
- Priority 3: Clean out excessive vegetation in drainage swale and provide positive outfall. Clean out outfall structure.
- Priority 2: Regrade front swale to provide positive drainage to culvert and clean out culvert.
- Priority 2: Regrade front drop-off area to alleviate low spots and provide positive drainage away from the building.
- Priority 2: Repair and stabilize areas of erosion.
- Priority 2: Provide inlets in the back of the school for drainage collection
- Priority 2: Construct stormwater management facility in the back of the school for quality and quantity control.
- Priority 2: Provide inlets for runoff collection around the playgrounds and repair erosion.
- Consider infiltration under the playgrounds

PHOTOGRAPHS



Figures 1 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

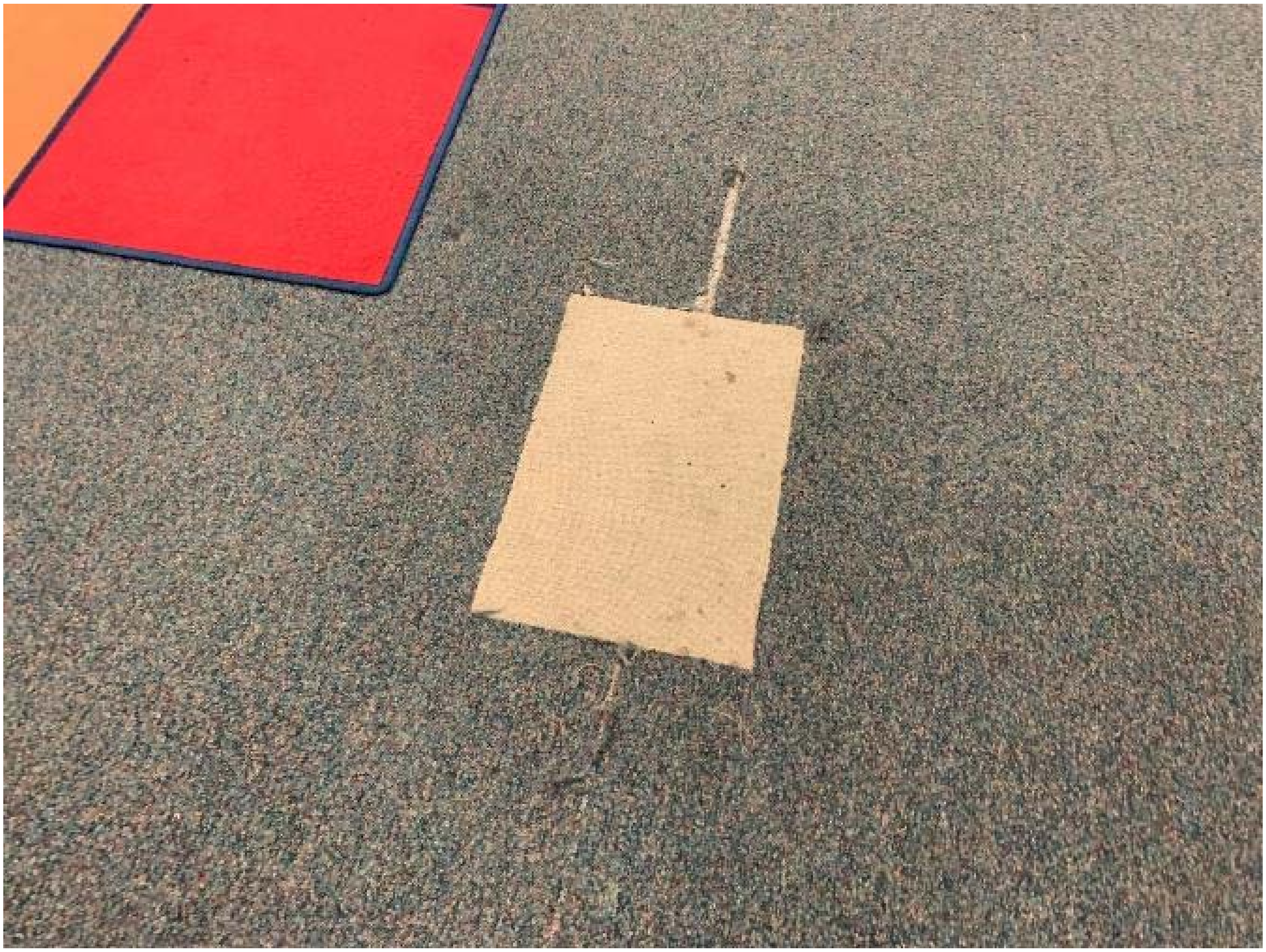


Figure 6: Carpets need replacement

Figure 7: Window Sweating

Figure 8: Paneling under the window pulling apart

Figure 9: Wall finish issues

Figure 10: Light dimmers required

Figure 11: Furniture laminates damaged

Figure 8: Fire Alarm Control Panels

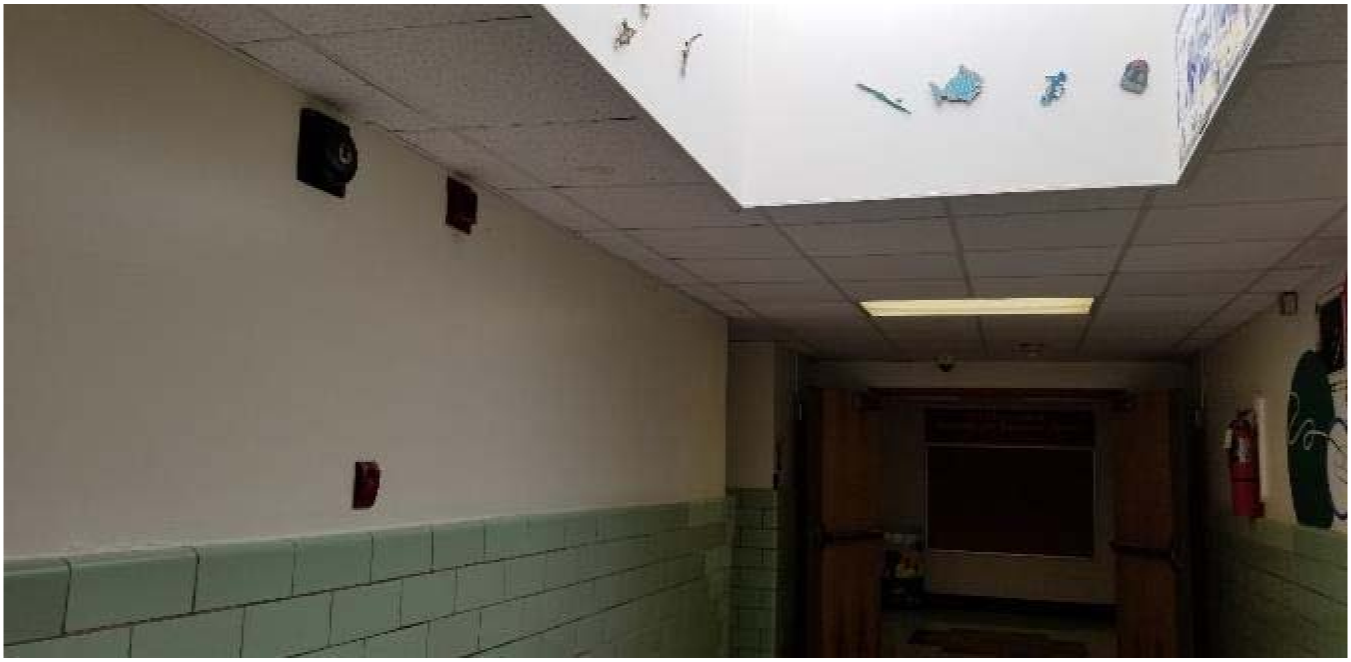


Figure 9: Fire Alarm Pull Station / Horn / Bell – No Strobes or Emergency Battery Pack

Figure 10: Cafeteria Service Counter – Floor Outlet Missing Cover Plate

Figure 11: Obsolete Panel 1-WW

Figure16: Vehicular pavement surface cracking and speed hump placement

Figure 17: Vehicular pavement subgrade failure/substantial pavement deterioration

Figure 18: Vehicular pavement concrete curbing damaged/concrete curb flume damage

Figure 19: Cracked/deteriorating concrete sidewalk panels and concrete steps

Figure 20: Basketball court pavement deterioration

Figure 21: Pervious pavement failure

Figure 22: Curb flume to drainage swale

Figure 23: Culvert requiring maintenance

Figure 24: Ramp at main entrance

Figure 25: Curb ramp at drop-off

Figure 26: Access route to road

Figure 27: ADA parking area

Figure 28: ADA parking area

Figure 29: ADA parking access

Figure 30: Northern ramp

Figure 31: western ramp

Figure 32: Playground access

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 complaint.
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 complaint. 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			
6	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

ALBRECHT
ENGINEERING INC

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.

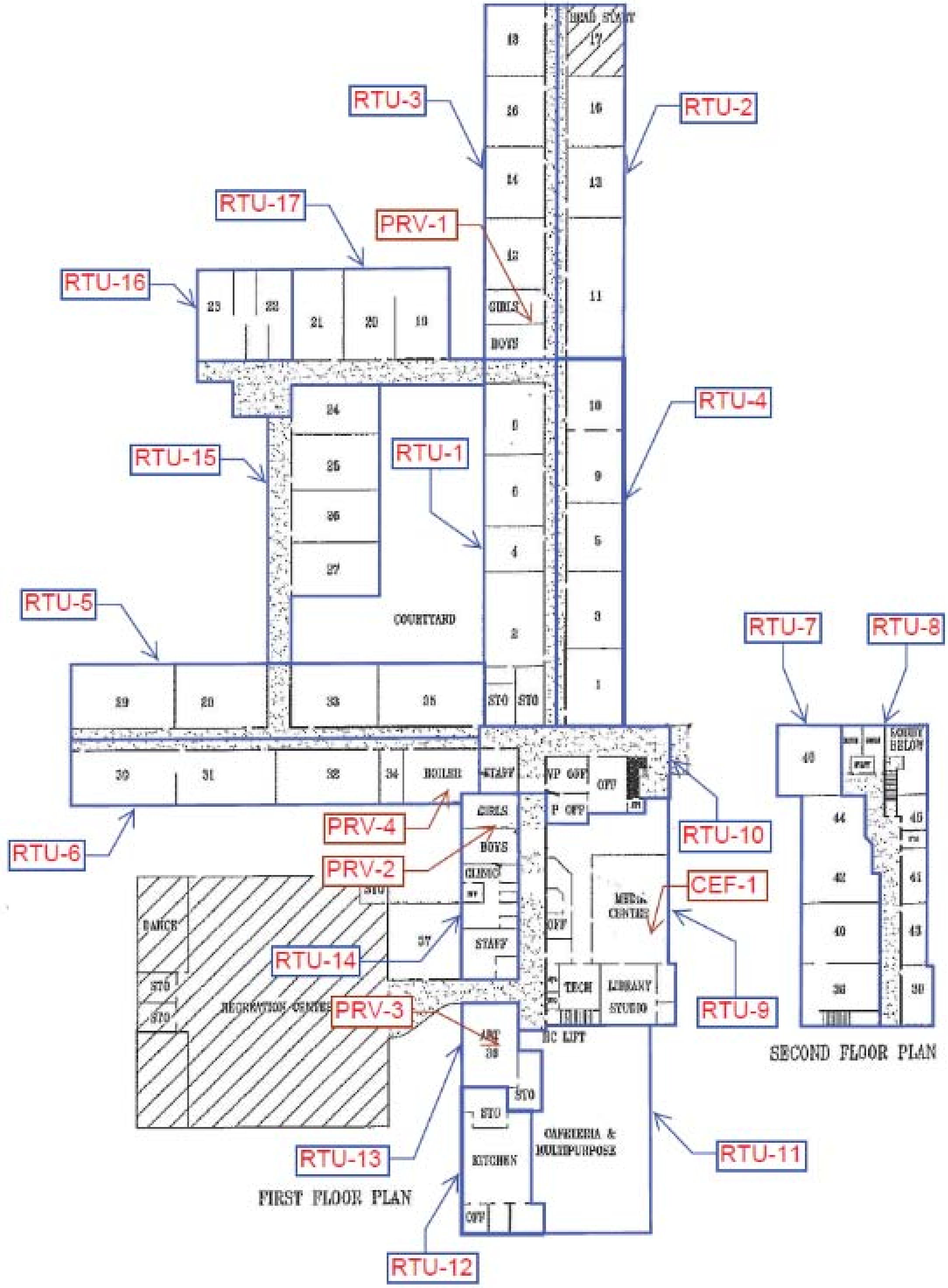
Observations:

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



PAVEMENT

1. SURFACE ASPHALT CRACKING W/ISOLATED SUBGRADE FAILURE AREAS
2. ASPHALT SUBGRADE FAILURE AND SUBSTANTIAL PAVEMENT DETERIORATION
3. MINOR SURFACE CRACKS IN ASPHALT
4. CRACKED/CHIPPED CONCRETE STEPS
5. PERVIOUS PAVEMENT SUBGRADE FAILURE, RUTTING, EXPOSED AGGREGATE, SURFACE HEAVING AND CRACKS
6. CRACKED/DETERIORATED JOINTS ON SIDEWALK CONCRETE PANELS
7. DAMAGED/MISSING CURBING
8. PORTION OF SPEED HUMP EXTENDING INTO PARKING BAY
9. CONCRETE CURB FLUMES DAMAGED/FILLED WITH PAVEMENT DEBRIS

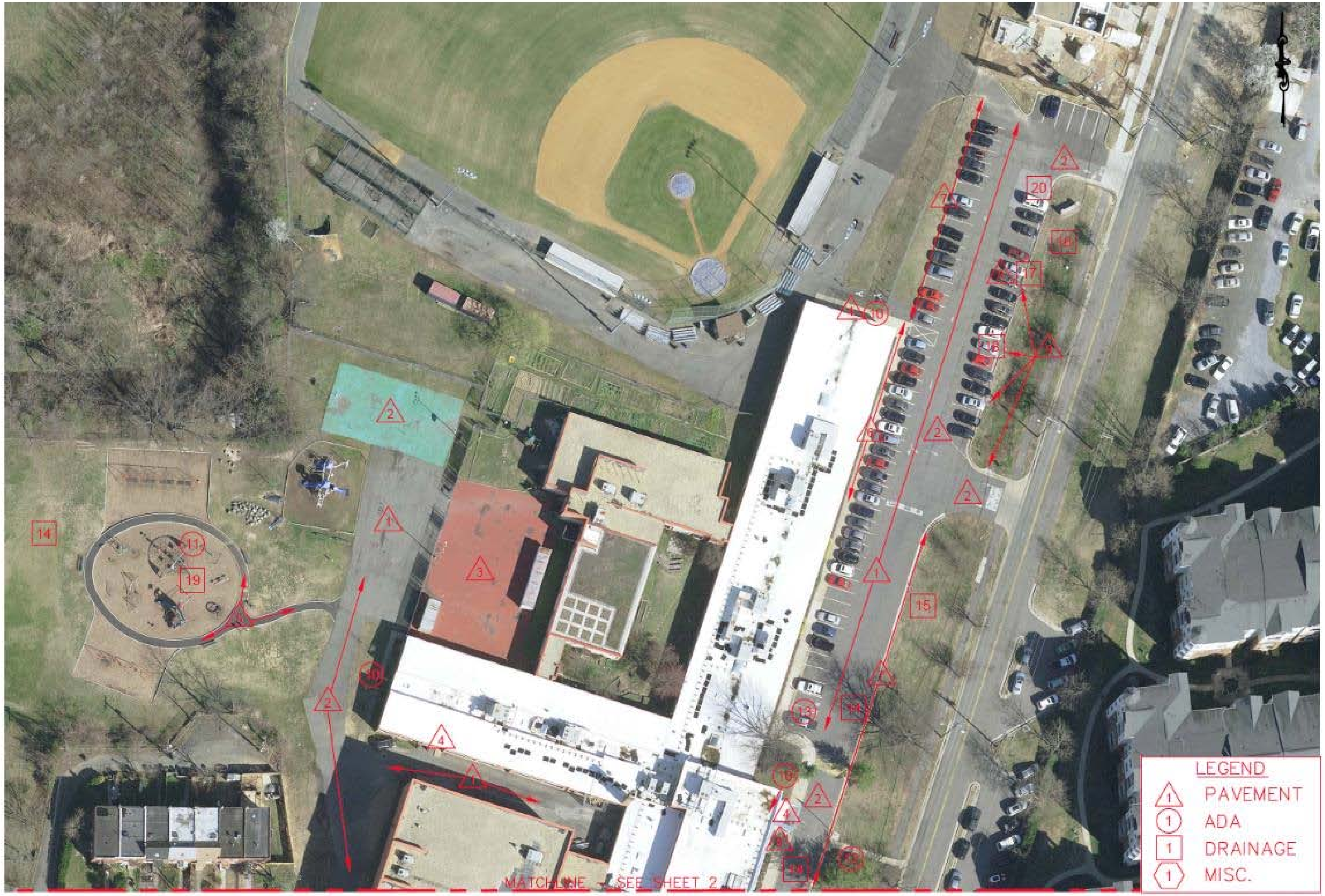
ADA 1

10. ADA NON-COMPLIANT RAMP SLOPE/RAILINGS
11. NO ADA ACCESS ROUTE
12. CROSSWALK NON-COMPLIANT
13. ADA PARKING SPACES NON-COMPLIANT

DRAINAGE 1

14. LOW SPOTS
15. REGRADE SWALE
16. SWM OVERGROWN
17. NO OUTFALL
18. NO COVER ON CULVERT
19. PLAYGROUND - FLAT AREA
20. CURB INLET FULL OF DEBRIS

EXHIBIT A (LEGEND)



CORA KELLY SCHOOL FOR MATH, SCIENCE AND TECHNOLOGY
3600 COMMONWEALTH AVE, ALEXANDRIA, VA 22305

1 OF 2

EXHIBIT A

SCALE: 1" = 80'

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3600 COMMONWEALTH AVE, ALEXANDRIA, VA 22305

2 OF 2

EXHIBIT A (CONT.)

SCALE: 1" = 80'

CLARK | AZAR & ASSOCIATES


Francis C. Hammond Middle School
4646
Alexandria City Public Schools
Every Student Succeeds

FRANCIS C. HAMMOND - GENERAL

A. 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 through 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 deficiencies are identified in “RECOMMENDATIONS”.

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 “DETAILED FINDINGS” for further descriptions of issues. The issues include the following:

- The roofing over the D wing has had extensive failures, evidenced by the hundreds of spot patches on the 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. COSTS

Refer to Section I-D "ACPS Targeted Condition Assessments – Planning Projections" for rough order of magnitude estimates associated with each remediation project identified.

FRANCIS C. HAMMOND – DETAILED FINDINGS

A. 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 its entirety.

B. 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 are 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 shut down 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 are 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.

C. 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.

The main electrical room housing 3000A, 208V service entrance switchboard and associated distribution panels is being used for 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 violation of the National Electrical Code (NFPA-70). The NEC requires working clearances around the main switchboard, panelboards, and other electrical equipment to be maintained. The items being stored in the main electrical room must 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.

D. 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.

E. STRUCTURAL

Refer to Supplemental Information, this chapter, for detailed discussion on findings.

F. CIVIL

a. ACCESSIBILITY

There are little to no access routes to the building or the site which are compliant with the requirements of the Americans with Disabilities Act (ADA).

- The ADA parking stalls on the north side of the building do not have compliant cross slopes or signage, are not the required size and do not have a compliant route into the building
- The existing ramp on the north side of the building for corridor access is not compliant with slope requirements.

- The ADA parking stalls near the main entrance are not compliant with size or signage and do not have an access route into the building.
- The ADA parking stalls near the roller hockey rink do not have compliant signage, are not a compliant size and do not have a compliant route to the roller hockey facility or the grass ballfields
- The grass ball fields on the north side of the building are not ADA accessible.
- The ADA parking stalls on the west side of the building do not have compliant slopes, size, or signage and do not have an accessible route into the building.
- The tennis courts do not have an accessible route to the building or the parking area.
- There is not an accessible route into the building from any public right-of-way.

b. DRAINAGE

Overall the drainage on the site was acceptable with a few noted exceptions. There was only one area with signs of erosion on the site, but there were areas of apparent water intrusion into the building.

- On the north side of the site, there was an inlet that was damaged that required some repair work and several areas where roof leaders discharged at grade onto sidewalk areas which could cause icy conditions in the winter.
- In the enclosed courtyard, several roof leaders have long corrugated pipes to direct water away from the building, however, they do not have positive slope and are causing wet areas and ponding on the surface. Roof leaders near canopy structures at all doors discharge onto the sidewalk. Areas along the perimeter of the courtyard are graded to drain back toward the building in several locations. The basement stair has an undersized drain at the bottom, and it was noted by the school's staff that the area experiences flooding during severe rain events.
- In the southern courtyard, the roof leaders from the bridge structure discharge onto grade, which can cause icy conditions. The grades on the north side of this courtyard also direct water toward the foundation instead of away from it. There is an inlet rim that extends slightly above the sidewalk grade which could be a mild tripping hazard.
- Throughout the exterior, most roof leaders are discharging to grade either to sidewalks or landscape areas. Some are creating areas that could be icy in the winter.
- On the west side of the tennis courts, there is some mild erosion on the steeper part of the slopes what warrants remediation.

c. PAVING

The paving around the site in general was degraded, however, in only a few places had it failed. A more detailed description is below. Overall the sidewalks were in good condition, with only some panels that needed to be replaced.

- The parking area and drive aisle on the north side of the building was in good overall condition with very little signs of subgrade failure. The surface course was degraded and in need of resurfacing.
- The parking area near the roller hockey rink showed obvious signs of subgrade failure in a large percentage of the overall area. Weeds and vegetation have grown up through the pavement. This parking lot would require a full replacement.
- The parking area to the west adjacent to the gymnasium entrance has several areas of subgrade failure that require full depth replacement, but each area was limited and suggest that a spot patch would be sufficient. The surface course was degraded and needs to be replaced.
- The parking area along Seminary Road did not appear to have anything beyond surficial cracking suggesting a resurfacing would be sufficient.
- The bus drop-off area pavement is in very good condition.
- There are a few sidewalk panels that need replacement around campus due to extensive cracking or heaving. This represents a small percentage of the sidewalk onsite.

d. SPECIAL CONSTRUCTION/MISCELLANEOUS SITE FEATURES

Overall the athletic facilities appear to be in good condition with a few exceptions.

- The tennis court paving has failed
- The retaining wall on the southern side of the loading area has a fall height of greater than 30”, but no safety rail present.

FRANCIS C. HAMMOND - RECOMMENDATIONS

A. 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' toilet 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 for 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 compliance. This team recommends that ACPS perform ongoing mold and ACM testing and mitigation of problem areas.
    - Deficiency Category: Environmental

Priority 2:

- <u>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 </u>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 with, we recommend lifecycle painting, including patching and refinishing areas where needed, and patching interior masonry wall cracks with flexible joint sealant. We also recommend 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:

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

B. 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 to 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 budgeted 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

C. 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 the abandoned dust collector room, perform an evaluation and identify existing electrical distribution equipment such as panelboards, disconnect switches, contactors, and wire troughs that are 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 the 208-Volt 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 the existing exit and emergency lighting system to further evaluate the 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

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 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

F. CIVIL

PAVEMENT

- Priority 3: Spot repair sidewalk panels that have failed.
- Priority 3: Replace failed pavement in and around the roller hockey rink.
- Priority 4: Mill and overlay the northern parking lot and drive aisle.
- Priority 4: Provide full depth repairs of minor areas and mill and overlay of entire western parking lot adjacent to the gymnasium.
- Priority 4: Replace the tennis court paving which has failed.

ACCESSIBILITY

- Priority 1: Provide an ADA compliant route from each ADA parking area into the adjacent building entrance.
- Priority 1: Provide an ADA compliant access point from Seminary Road to the school's main entrance
- Priority 2: Replace the existing ADA parking areas in all parking lots with compliant paving and compliant signage.
- Priority 2: Provide an ADA compliant route from the parking area near the roller hockey rink to the grass playing fields on the north side of campus.
- Priority 2: Provide ADA access to the learning spaces in the enclosed courtyard from one or more doors. Provide ADA compliant areas at each distinct learning space in the courtyard.
- Priority 2: Correct ADA accessible ramp on north side of school which is non-compliant.
- Priority 3: Provide ADA access to the gymnasium and tennis courts from the parking area.

SAFETY

- Priority 2: Provide safety railing at retaining wall near loading area on west side of the building

DRAINAGE

- Priority 1: Address grading issues in enclosed courtyard. Areas adjacent to the building should be graded to provide positive drainage away from the building.
- Priority 1: Provide hard piping of roof leaders in enclosed courtyard to storm structures to eliminate ponding and wet areas.
- Priority 1: Provide an additional drain at lower level of exposed staircase to alleviate existing flooding issues.

- Priority 1: At the southern courtyard, hard pipe the roof leaders on the bridge structure to the adjacent storm manhole.
- Priority 1: At the exterior of the entire building, connect roof leaders that are currently discharging on sidewalks, to a closed storm drainage system to prevent icing and water intrusion.
- Priority 4: Stabilize mild erosion on the west side of the tennis courts.

FRANCIS C. HAMMOND - 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 2nd 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*

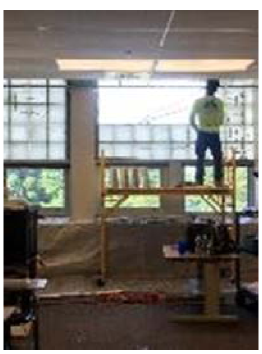


Figure 8. *Window replacement (Left to right) E wing <u>in progress</u> and B wing <u>soon to commence</u>.*

Classroom Samples

Classroom flooring wear & tear – refer to matrix

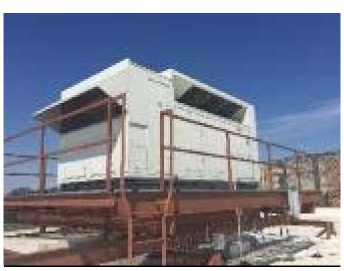
Classroom wall finish issues – refer to matrix

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 STORAGE

DUST COLLECTOR ROOM

ELECTRICAL ROOM -

Grading near courtyard wall

Typical Access to courtyard

Drainage in Courtyard

ADA Parking at Roller Hockey

Access/Parking near gymnasium

Noncompliant Railing

Northern ADA parking

Access from Seminary Road

Pavement Condition at West Lot

Grading at courtyard

Roof leader discharging at sidewalk

Access to tennis court

Access to Grass Playfield

Pavement condition at roller hockey

Pavement condition at northern parking

Cross slope

ADA Parking at North lot

Erosion near tennis court

Pavement condition at tennis

Northern ADA ramp

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	

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ALBRECHT
ENGINEERING INC

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.



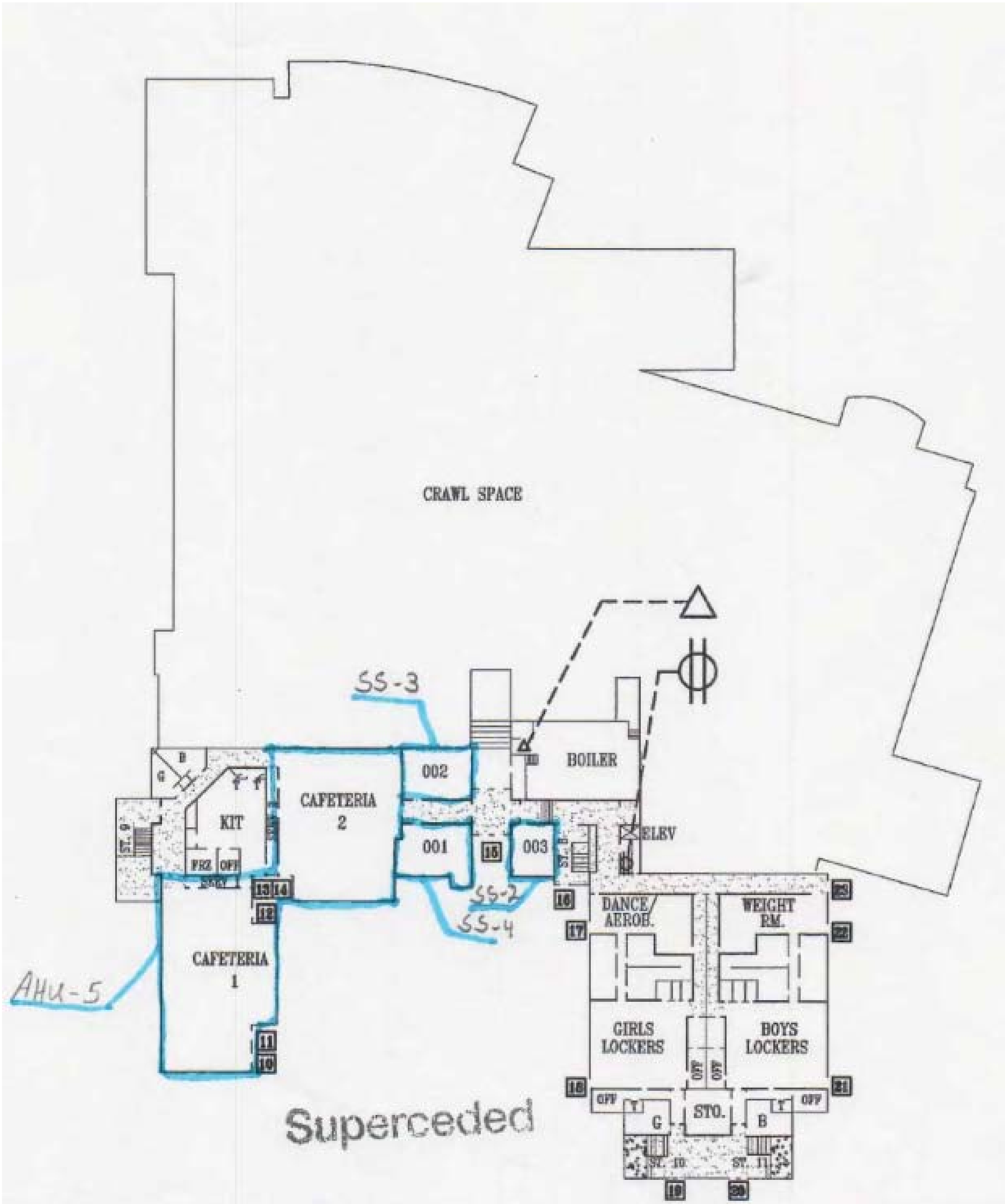

Observations:

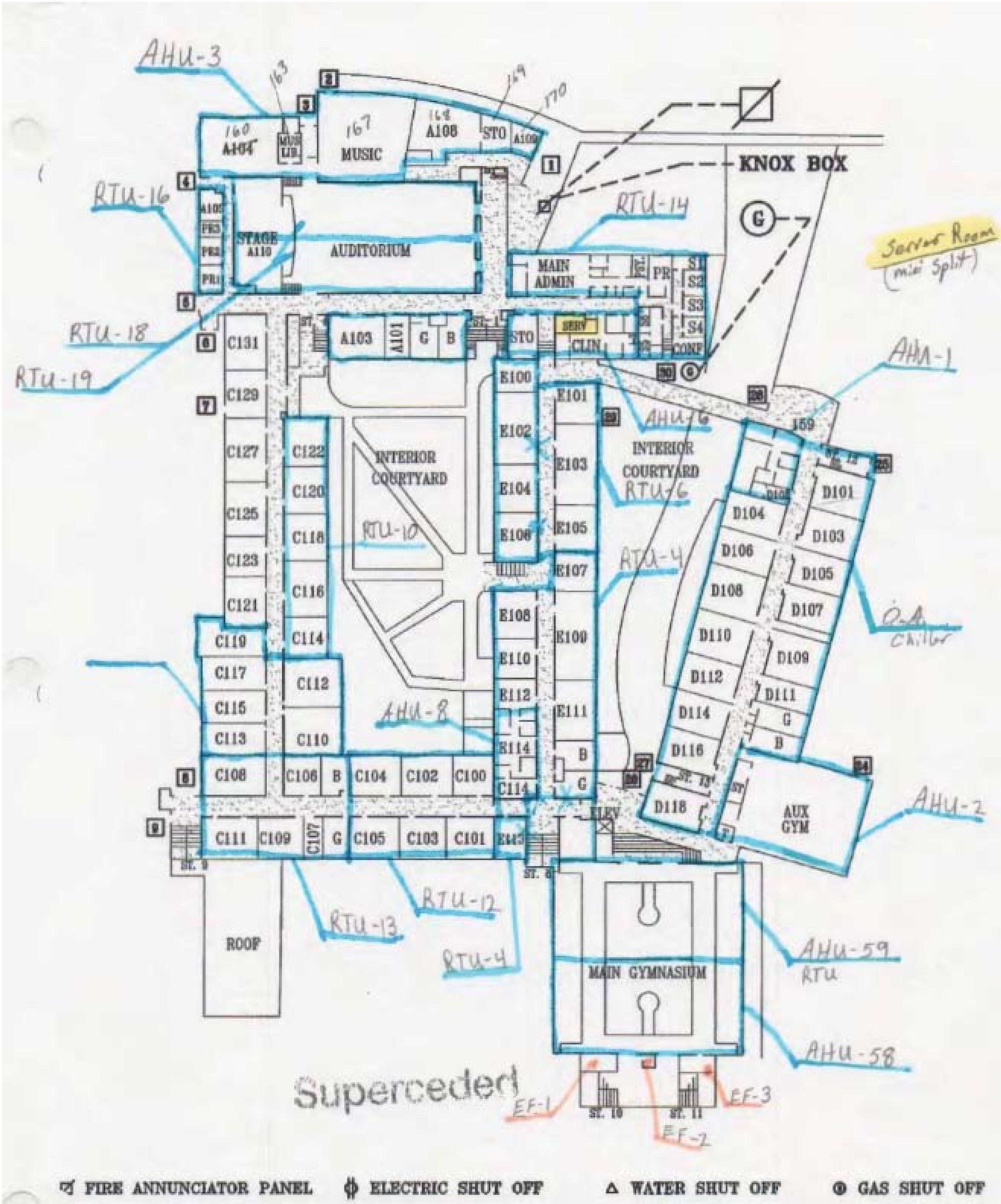
At each of the four walls in the gymnasium, there are small cracks between the walls and the columns. The size of the cracks varies by column, but the widest crack measured was about ½". There also appears to be separation at the wall corners – one corner is separated along its entire length. These cracks do not present a major concern. The location of the cracks suggests that columns and walls are moving separately.

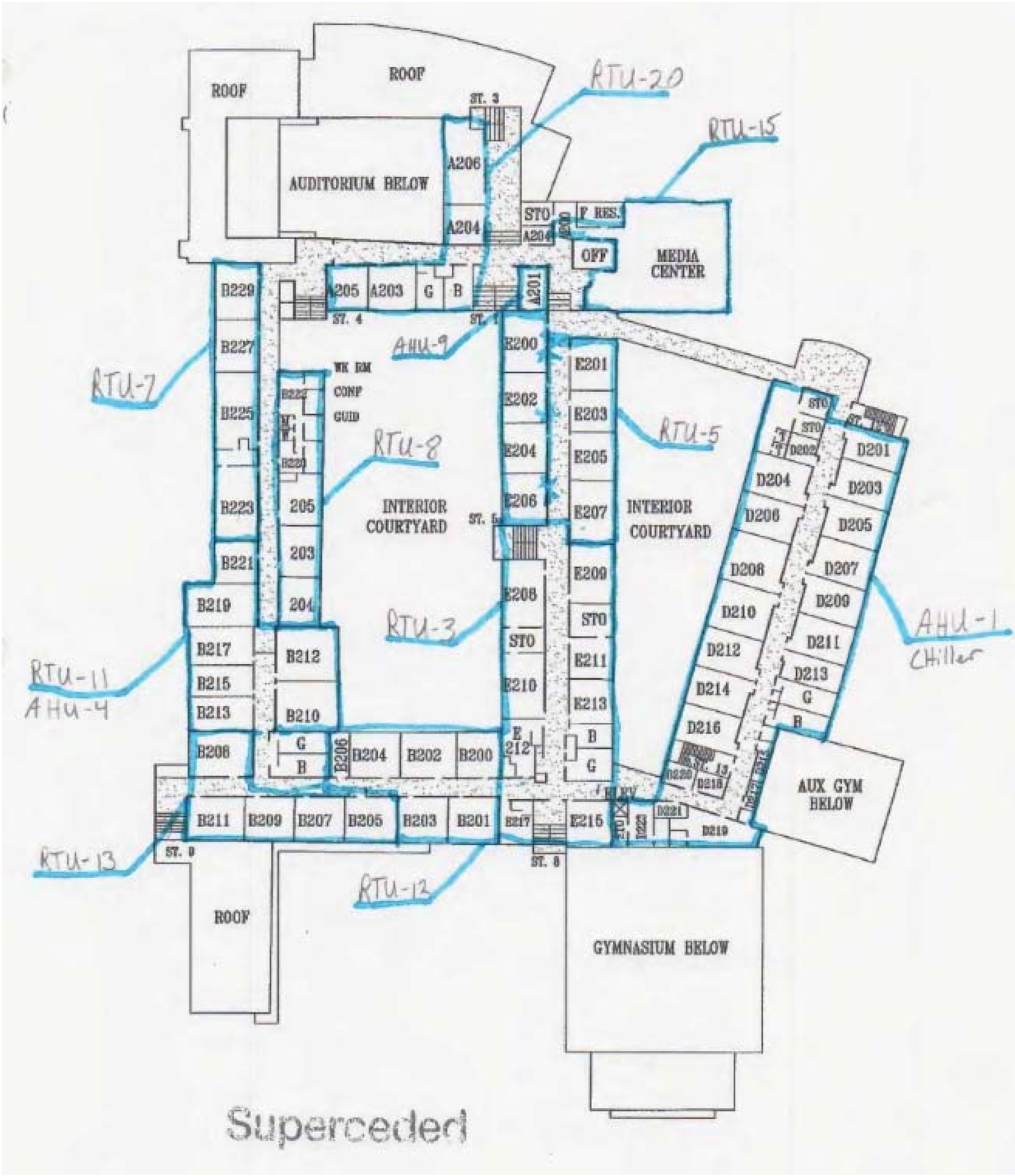
Recommendations:

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




AHU-3
MUSIC
A108
STO
KNOX BOX
RTU-16
RTU-14
STAGE A110
AUDITORIUM
MAIN ADMIN
Server Room (mini Split)
RTU-18
RTU-19
C131
A103
CLIN
AHU-1
C129
E100
E101
AHU-6
C127
C122
INTERIOR COURTYARD
E102
E103
INTERIOR COURTYARD
RTU-6
D101
C125
C120
E104
D104
D103
C123
C118
RTU-10
E106
E105
D106
D105
C121
C116
RTU-4
E107
D108
D107
C119
C114
E108
E109
D110
D109
O.A. Chiller
C117
C112
E110
D112
D111
C115
AHU-8
E112
E111
D114
C113
C110
E114
D116
C108
C106
C104
C102
C100
C114
D118
AUX GYM
AHU-2
C111
C109
C107
C105
C103
C101
ELEV
ROOF
RTU-13
RTU-12
RTU-4
MAIN GYMNASIUM
AHU-59 RTU
AHU-58
Superceded
EF-1
EF-2
EF-3
FIRE ANNUNCIATOR PANEL
ELECTRIC SHUT OFF
WATER SHUT OFF
GAS SHUT OFF


ROOF
ROOF
ST. 3
RTU-20
RTU-15
AUDITORIUM BELOW
A206
A204
STO
F RES.
OFF
MEDIA CENTER
B229
A205
A203
G
B
A201
ST. 4
ST. 1
B227
RTU-7
AHU-9
E200
E201
WK RM
CONF
GUID
B225
E202
E203
RTU-5
RTU-8
E204
E205
B223
205
INTERIOR COURTYARD
E206
E207
INTERIOR COURTYARD
ST. 5
B221
203
E209
B219
204
E208
STO
RTU-3
B217
B212
STO
E211
RTU-11
AHU-4
B215
E210
E213
B213
B210
B208
G
B
B206
B204
B202
B200
B
G
B211
B209
B207
B205
B203
B201
B217
E215
ST. 9
ST. 8
RTU-13
RTU-12
ROOF
GYMNASIUM BELOW
D201
D203
D204
D205
D206
D207
D208
D209
D210
D211
D212
D213
D214
D216
D219
D221
AHU-1
Chiller
AUX GYM BELOW
Superceded

ADA 1

1. ADA SIDEWALK SLOPE NON-COMPLIANT
2. ADA PARKING SPACES NON-COMPLIANT
3. NO ADA ACCESS ROUTE AVAILABLE
4. ADA RAILING NON-COMPLIANT - FALL HAZARD

PAVEMENT 1

5. PAVEMENT REPAIR- MILL & OVERLAY NEEDED
6. SIDEWALK REPAIR

DRAINAGE 1

7. PROVIDE POSITIVE DRAINAGE AWAY FROM BUILDING
8. INLET DAMAGE CAUSING TRIP HAZARD
9. EROSION
10. FLOODING ISSUE
11. DRAINAGE CONVEYANCE ISSUE AT INLET
12. OTHER DRAINAGE ISSUE

MISCELLANEOUS 1

13. COURTYARD BENCHES IN NEED OF REPAIR
14. ISSUE AT WINDOW WELL

EXHIBIT A (LEGEND)

CLARK | AZAR & ASSOCIATES

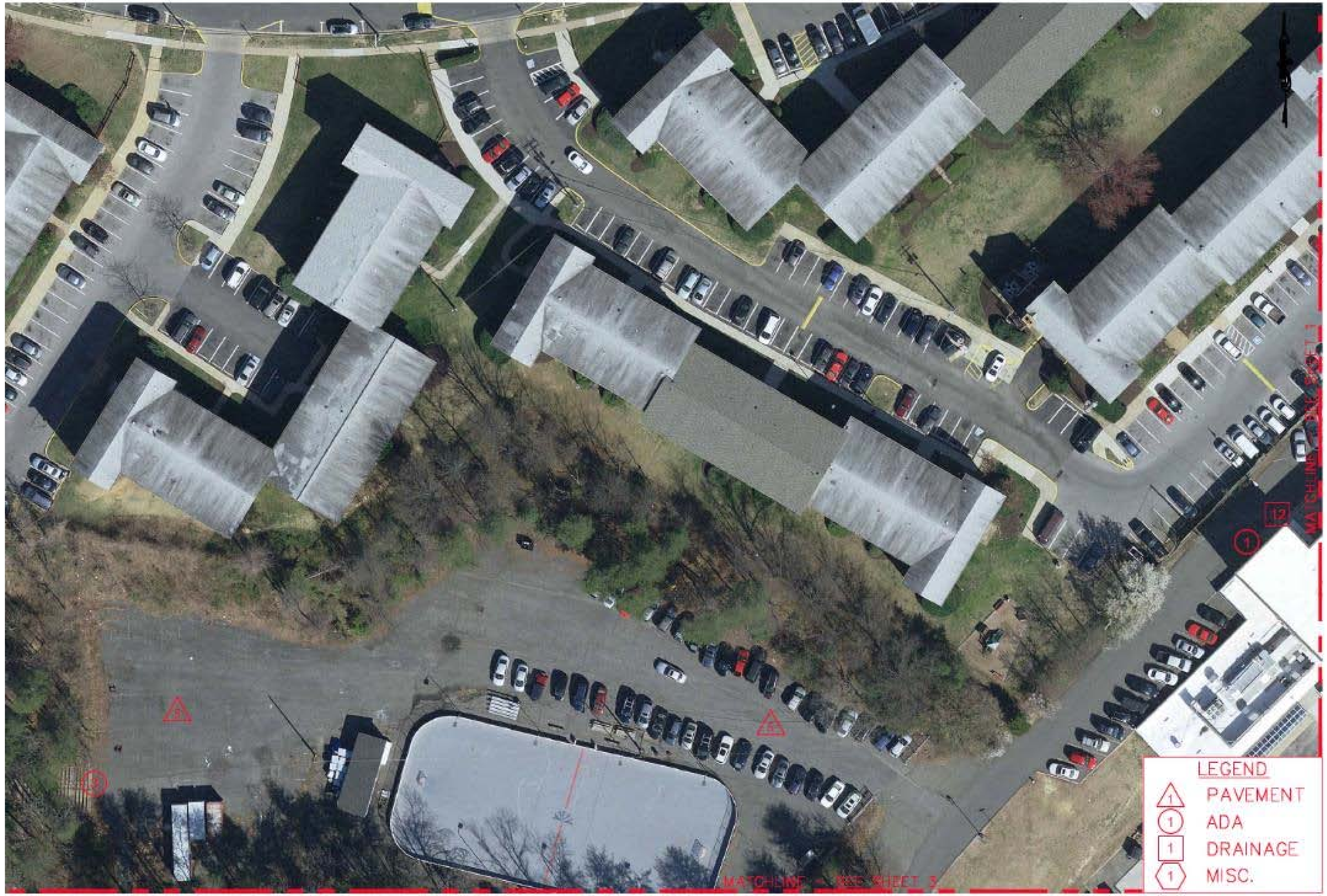
FRANCIS C HAMMOND MIDDLE SCHOOL
4646 SEMINARY RD, ALEXANDRIA, VA 22304

1 OF 4

EXHIBIT A

SCALE: 1" = 80'

CLARK | AZAR & ASSOCIATES

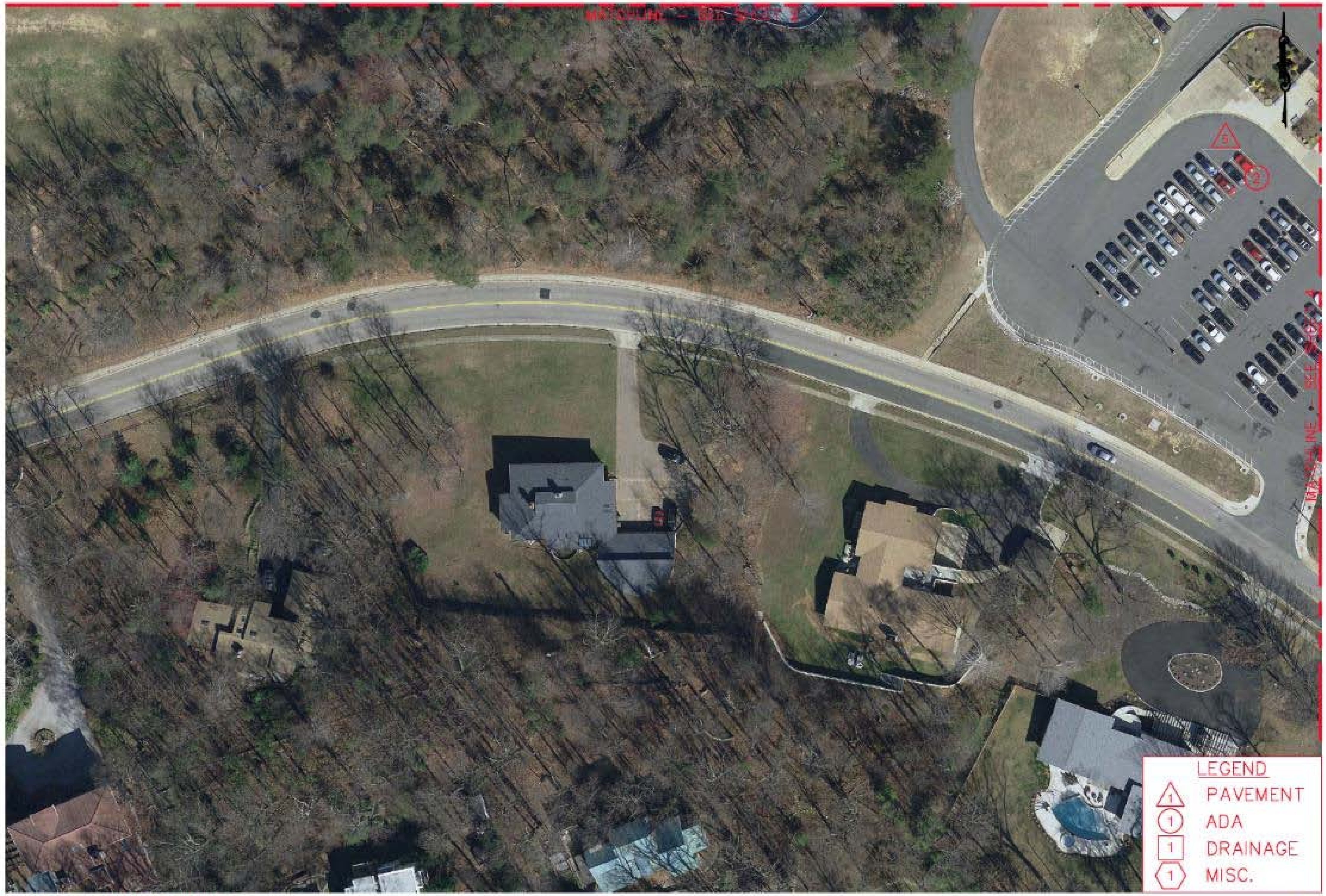


FRANCIS C HAMMOND MIDDLE SCHOOL
4646 SEMINARY RD, ALEXANDRIA, VA 22304

2 OF 4

EXHIBIT A (CONT.)

SCALE: 1" = 80'



FRANCIS C HAMMOND MIDDLE SCHOOL
4646 SEMINARY RD, ALEXANDRIA, VA 22304

3 OF 4

EXHIBIT A (CONT.)

SCALE: 1" = 80'

FRANCIS C HAMMOND MIDDLE SCHOOL
4646 SEMINARY RD, ALEXANDRIA, VA 22304

4 OF 4

EXHIBIT A (CONT.)

SCALE: 1" = 80'

CLARK | AZAR & ASSOCIATES


George Mason Elementary School
GEORGE MASON
2601
1

GEORGE MASON - GENERAL

A. 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 deficiencies are identified in "RECOMMENDATIONS".

B. SUMMARY OF FINDINGS

The surveys resulted in the discovery of numerous issues and concerns. Refer to "DETAILED FINDINGS" for further descriptions. The issues include the following:

- Existing roofing with low slop 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.

C. 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

D. COSTS

Refer to Section I-D "ACPS Targeted Condition Assessments – Planning Projections" for rough order of magnitude estimates associated with each remediation project identified.

GEORGE MASON – DETAILED FINDINGS

A. 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 areaways 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.

B. MECHANICAL, PLUMBING AND FIRE PROTECTION

- The school is served by a 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 to 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 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.

C. 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. This condition is a violation of Article 110 of the National Electrical Code.

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.

Life Safety

Emergency egress lighting consists of emergency battery units (EBU's) with twin lamps and certain unswitched luminaires. The EBU's are located in corridors and interior rooms. The luminaires are located in the library and stairwells. The placement and quantities of EBU's, alone, appears to be inadequate to provide the required minimum illumination level during a power outage. The EBU's and unswitched luminaires are supplied by branch circuits from the emergency lighting panelboard located in the basement electrical room.

Exit signs are internally illuminated and are also supplied by branch circuits from the emergency lighting panelboard located in the basement electrical room.

D. FIRE ALARM

The existing fire alarm system consists of 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.

E. CIVIL

a. PAVEMENT

The school grounds include a loading area with parking and an access road at the rear of the school, various pedestrian access walkways around the building, stone aggregate walkways around the recess areas and through the school garden in the front, a paved hardscape play area, and a rubber play surface playground. (Refer to "Supplemental Information", this chapter, for Exhibit A).

A majority of the asphalt pavement within the rear loading/parking area displayed a sporadic distribution of surface cracking with isolated areas throughout exhibiting subgrade/pavement failure (Figure 1). These locations are indicated as 5 in Exhibit A. Additionally, there was one large area located within the rear paved access road that is showing signs of subgrade failure and substantial pavement degradation from what appears to be multiple patching and trenching activities in that area in the past (Figure 2). This area is indicated as 9 in Exhibit A.

The concrete and asphalt curbing along a portion of the loading/parking area has long spans throughout that are damaged or missing (Figure 3) and are indicated as 7 in Exhibit A.

A majority of the parking lot and loading area pavement markings are faded or are no longer visible (Figure 4). These pavement parking deficiencies are indicated as 8 in Exhibit A.

Much of the concrete sidewalks and access walkways around the exterior of the building were in fair condition, with a few sidewalk panels that were cracked or had deteriorating joints (Figure 5). The various locations are shown as 12 in Exhibit A. A few of the existing concrete steps at access points to the building showed signs of deterioration from age, cracks, and riser nosing chips (Figure 5). These locations are shown as 10 in Exhibit A. There are two landings at the tops of the existing concrete steps that were paved with slate/stone pavers that were cracked or severely deteriorating, which is a tripping hazard (Figure 6). Their locations are indicated as 11 in Exhibit A.

Almost the entire length of the stone aggregate walkways on the school grounds is missing stone and does not have a consistent and level walking surface due to washout and/or uneven settlement (Figure 7). This is especially pronounced at the connection points to the existing concrete sidewalks as well as where manhole lids and other appurtenances are within the walkway limits. These areas are indicated as 6 in Exhibit A.

The entire rubber play surfacing surrounding the playground equipment area is deficient, with large portions of the surface heaving, displaying uneven subgrade conditions and settlement, as well as cracking and joint separation (Figure 8). These were significant pavement issues that affect the overall safety and functionality of the play space. This location is indicated as 13 in Exhibit A.

The existing colored asphalt hardscape play area had very minimal surface cracking with small areas of worn/chipped paint and is indicated as 3 in Exhibit A (Figure 9).

The dumpster enclosure at the end of the parking lot towards the rear of the school does not have a heavy-duty concrete pad, which will cause the underlying asphalt pavement within and around the enclosure to fail over time (Figure 10). This location is indicated as 4 in Exhibit A.

b. ACCESSIBILITY

There is little to no access to the building and the site is not compliant with the Americans with Disabilities Act (ADA) requirements:

- The ADA parking stalls on the east side of the building do not have compliant cross slopes or signage, are not the required size, and do not have a compliant route into the building.
- The existing ramp on the south side of the building for corridor access is non-compliant with slope requirements and railing style.
- The sidewalk from the road toward the main entrance is not fully compliant. The sidewalk near the main entrance and the landing outside the main door are non-compliant for slopes.
- The grass ball fields on the east side of the building are not ADA accessible.
- The tennis courts to the far east of the building do not have an accessible route to the building or to the adjacent parking area.
- The ramps on the north side of the gym adjacent to the basketball court are not compliant for slope, width, or railings.
- There is not an ADA compliant route to the individual playground equipment pieces on the north side of the building.
- There is not an ADA compliant route from the building or parking area to the large playground adjacent to the basketball courts.
- The benches adjacent to the playground are not ADA accessible.
- The picnic tables on the north side of the building adjacent to the grass ballfields are not ADA accessible nor compliant. There is no ADA seating available.
- Tables at the fenced-in courtyard are not arranged in a way that allow accessible seating. The tables need to be rotated and reconfigured.

c. SPECIAL CONSTRUCTION/MISCELLANEOUS SITE FEATURES

Overall, the athletic facilities/special facilities appear to be in good condition with a few exceptions:

- There is no apparent safety surfacing on the individual play equipment pieces on the north side of the building.
- Some of the poured-in-place safety surfacing on the main playground has separated from adjacent curbs and structures, creating some gaps.

d. DRAINAGE

Overall the site drainage is in need of maintenance and improvements. The majority of the inlets onsite are clogged and in need of repair or replacement. There are a significant number of areas of extensive erosion. The only stormwater management onsite is a series of planter beds that receive roof drainage. There are a significant number of low spots around the site which pond surface water and will create icy conditions in the winter. The site appears to be divided into two drainage areas:

1. Cameron Mills Road Drainage Area

   The front (east side) of the school sheet flows with little control to the Cameron Mills drainage system. There are areas of low spots that collect water that need to be remedied for positive flow. There are also roof leaders and condensation drains around the entire building that outfall to grade without positive flow away from the building.

2. George Mason Place Drainage Area

   The back of the school including the paved play areas and parking areas sheet flow to curb inlets which discharge to a swale along the northeast property line and eventually to the George Mason Place Drainage storm drain system. The inlets are in need of repair and maintenance. The two mulch playgrounds have timber edging which is several inches above grade, therefore, water cannot discharge and must infiltrate or pond the height of the timber edging. The surface did not appear to promote infiltration and it is likely that water sits in the playground for extended periods of time. The poured in place playground and the ballfields sheet flow to the ditch along the northern property line. The inlets within the ditch are clogged with heavy vegetation grown around them which prohibit effective flow. The field is not well graded and has a significant number of low spots. There is significant erosion all over the property. There is also ponding on the tennis courts.

GEORGE MASON - RECOMMENDATIONS

A. 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
- Closet doors throughout the classrooms are in poor shape as a result of quick fix projects and heavy use. We recommend replacing 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 years, 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

B. 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

C. 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

D. 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

E. CIVIL

a. PAVEMENT

- We recommend performing all pedestrian access pavement and playground pavement repairs/replacements during Phase 1 (Civil) with the following scope:
  - Priority 2: Patch or replace existing concrete steps that are cracked, missing chunks of concrete, and have significant surface and riser nosing wear from age.
  - Priority 2: Remove and replace cracking and broken slate/stone pavers at landings of steps with concrete landings or new stone pavers with a level and gap-free surface.
  - Priority 3: Replace the stone aggregate that has washed out from the walkways on the school grounds to provide an even walking surface throughout and to be flush with existing manholes and appurtenances within the walkway. Additionally, we recommend that the entire length of the stone aggregate walkway have an edging installed on the downhill edge of the walkway path to avoid future washout and depletion of walkway stone aggregate.
  - Priority 3: Replace cracked/damaged concrete sidewalk panels along pedestrian walkways.
  - Priority 4: Perform minor crack sealing and painting of chipped colored asphalt in hardscape play area.
  - Priority 4: Remove and replace the entire rubber play surfacing around the playground equipment.
- We recommend performing all vehicular pavement and curbing repairs/replacements during Phase 2 (Civil) with the following scope:
  - Priority 3: All areas with subgrade failure and major pavement deterioration shall receive full-depth asphalt pavement replacement.
  - Priority 3: All areas exhibiting minor surface cracks and missing/damaged surface pavement shall be milled and overlaid.
  - Priority 4: All missing or faded striping should be replaced.
  - Priority 4: Replace damaged asphalt and concrete curbing around parking and loading areas.
  - Priority 4: Install a heavy-duty concrete dumpster pad at the one trash enclosure at the rear end of the parking lot.

b. ACCESSIBILITY

- Priority 2: Replace the existing ADA parking areas with compliant paving and compliant signage.
- Priority 2: Provide an ADA compliant route from ADA parking spaces into the adjacent building entrance.
- Priority 2: Provide an ADA compliant access point from the road to the school's main entrance

- Priority 2: Replace the existing non-compliant ramps on the exterior of the building.
- Priority 3: Provide an ADA compliant route from the building to the play areas and playground
- Priority 3: Provide an ADA compliant route to one of the ballfields

c. DRAINAGE

Priority 1:

- Clean out and repair all inlets onsite
- Stabilize and repair areas of erosion
- Remove excessive vegetation from around inlets within the discharge swale. Regrade the swale to promote positive drainage
- Regrade field area to provide positive drainage and alleviate low spots
- Provide inlet to receive drainage from parking lot adjacent to tennis courts. Repair erosion channel that has formed in the northwest corner of the parking lot
- Provide inlet or regrade to alleviate ponding at low spot in the loading area
- Repair all roof leaders and provide positive drainage away from the building
- Install a series of yard inlets to collect runoff on the west and north sides of the property. Provide positive drainage to the inlets
- Set timber edging flush with grade on the mulch playgrounds. Provide yard inlets and positive drainage to them to alleviate playground flooding
- Provide additional stormwater management facilities to collect and treat runoff and provide quantity and quality control
- Consider infiltration under the playgrounds

GEORGE MASON - SUPPLEMENTAL INFORMATION

PHOTOGRAPHS

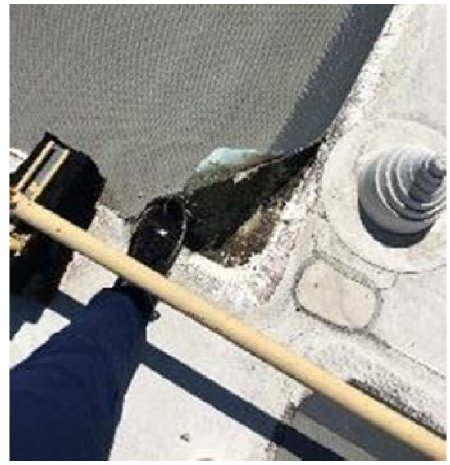


Figure 12 Roof Failures

Figure 13 Exterior Wall Moisture and Settlement Cracks

Figure 14 Inoperable Window Hardware

Figure 15 Inadequate Stormwater Drainage

Classroom Samples

Figure 16 Wall Finishes

Figure 17 Low Closet and Door Hooks

Figure 18 Ceiling Stains

Figure 8 No Stall Doors

Figure 9 Settlement Crack (seen in Library)

Figure 10: Fire Alarm Control Panels

Figures 11 and 12: (left) Panelboard mounted above glazed CMU. (right) Panelboard In Boiler Room – sealed in by construction of new wall.

Figures 13 and 14: (left) Bare lamp above storage shelf in attic. (right) Storage attic.

Figures 15 and 16: (left) Storage attic. (right) Generator and utility company transformer.

Figures 17 and 18: (left) Puddle on electrical room floor in basement. (right) Sump pit in electrical room.

Figure 19: Vehicular Pavement – Surface Cracking

Figure 20: Vehicular Pavement – Subgrade Failure/Substantial Pavement Deterioration

Figure 21: Vehicular Pavement – Concrete and Asphalt Curbing Damaged/Missing

Figure 22: Vehicular Pavement – Faded/Missing Striping

Figure 23: Pedestrian Pavement – Cracked/Deteriorating Concrete Sidewalk Panels and Concrete Steps

Figure 24: Pedestrian Pavement – Cracked and Damaged Slate Pavers at Doorways

Figure 25: Pedestrian Pavement – Stone Aggregate Walkway (Additional Stone Required)

Figure 26: Pedestrian Pavement – Rubber Play Surfacing Damaged/Heaving

Figure 27: Pedestrian Pavement – Colored Asphalt Hardscape Play Area – Minor Surface Cracking

Figure 28: Vehicular Pavement – No Dedicated Concrete Dumpster Pad

Figure 29: No ADA access to play area

Figure 30: Non-compliant ramp

Figure 31: Non-compliant courtyard seating

Figure 32: Ramp

Figure 33: Seating

Figure 34: ADA obstruction

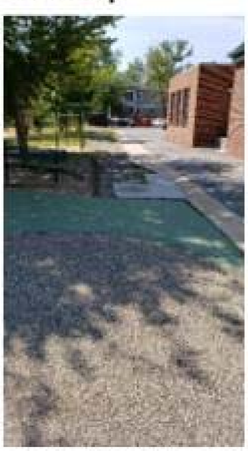


Figure 35: Non-compliant access to play area

Figure 36: Non-compliant access to playground

Figure 37: Non-compliant parking

Figure 38: Clogged curb inlet

Figure 39: Roof Leader without positive discharge

Figure 40: Playground without discharge

Figure 41: Swale and inlet requiring maintenance

Figure 42: Erosion from tennis court parking runoff

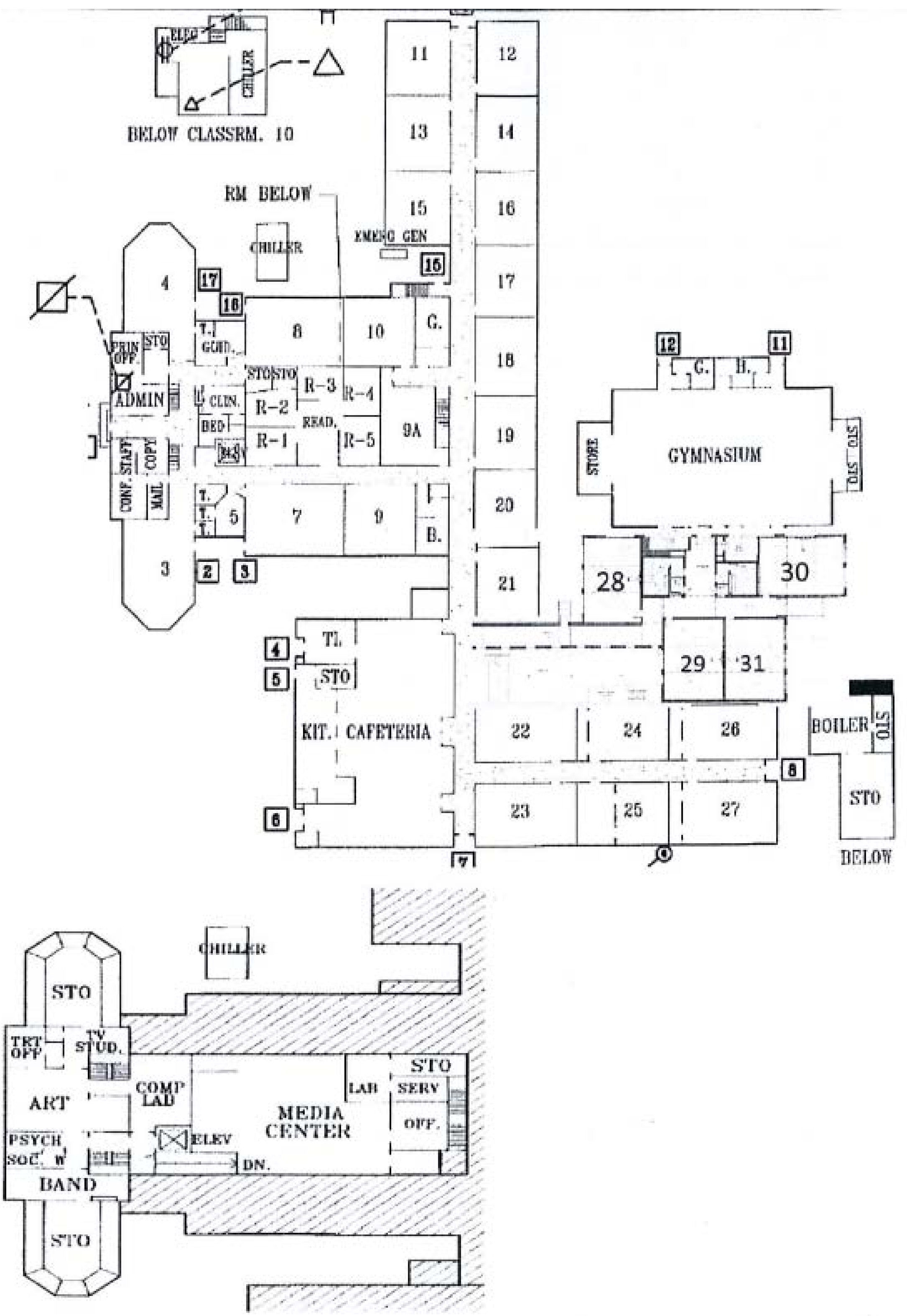
Figure 43: Erosion around back playground

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



ADA 1

1. ADA ACCESS ROUTE - NON-COMPLIANT
2. LANDING/RAMP SLOPE - NON-COMPLIANT
3. PICNIC TABLE - NOT ADA ACCESSIBLE

PAVEMENT 1

4. NO DESIGNATED CONCRETE DUMPSTER PAD
5. SURFACE ASPHALT CRACKING W/ISOLATED SUBGRADE FAILURE AREAS
6. AGGREGATE WALKWAY REQUIRES ADDITIONAL STONE
7. DAMAGED/MISSING CURBING
8. FADED/MISSING STRIPING
9. ASPHALT SUBGRADE FAILURE AND SUBSTANTIAL PAVEMENT DETERIORATION
10. CRACKED/CHIPPED CONCRETE STEPS
11. SLATE PAVERS CRACKED/DAMAGED
12. CRACKED/DETERIORATED JOINTS ON SIDEWALK CONCRETE PANELS
13. RUBBER PLAY SURFACING DAMAGED/HEAVING
14. COLORED ASPHALT HARDSCAPE PLAY AREA - MINOR SURFACE CRACKS

DRAINAGE 1

15. LOW SPOTS
16. CLOGGED DRAIN/BLOCKAGE
17. EROSION
18. PONDING
19. RL ISSUE W/O DISCHARGE
20. POSITIVE DRAINAGE FLOW ISSUE
21. NO SWM IN PLACE
22. INLET ISSUE
23. OTHER DRAINAGE ISSUE

MISCELLANEOUS 1

24. MISSING SAFETY SURFACING IN PLAY AREA
25. LEAVES

EXHIBIT A (LEGEND)

CLARK | AZAR & ASSOCIATES

GEORGE MASON ELEMENTARY SCHOOL
2601 CAMERON MILLS RD, ALEXANDRIA, VA 22302

EXHIBIT A

CLARK | AZAR & ASSOCIATES

SCALE: 1" = 80'

IIID- DETAILED BUILDING AND DEFICIENCY DATA

GEORGE WASHINGTON MIDDLE SCHOOL - GENERAL

A. 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 that 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 observed 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 has 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 actions associated with each of the deficiencies are identified in SECTION III. RECOMMENDATIONS.

B. SUMMARY OF FINDINGS

The surveys resulted in discovery of several issues and concerns which are leading to unsatisfactory conditions within the building. Refer to "DETAILED FINDINGS" for further descriptions of issues. The issues 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 excessive roof drain discharge into the courtyards.
- 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.

C. REMEDIATION APPROACH

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

Remediation actions associated with each of the deficiencies are identified in SECTION III. RECOMMENDATIONS.

D. COSTS

Refer to Section I-D "ACPS Targeted Condition Assessments – Planning Projections" for rough order of magnitude estimates associated with each remediation project identified.

A. 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 the interior and the 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, and are 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

B. 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

C. 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 20 watts per square foot 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 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.

D. FIRE ALARM

The building's fire alarm and detection system was upgraded around 2006. The system is functional and being tested on a 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.

E. CIVIL

a. PAVEMENT

The school grounds include two large parking areas to the rear and side of the school, a bus/parent drop-off loop that runs along the sides and rear of the school building, various pedestrian access walkways and courtyards around the building, an asphalt running track surrounding an athletic field, two playgrounds with rubber play surfacing, and a colored asphalt tennis court. (Refer to "Supplemental Information", this chapter, for Exhibit A).

A majority of the asphalt pavement within the parking lots, drop-off loop, and various access roads displayed a sporadic distribution of surface cracking with isolated areas throughout exhibiting subgrade/pavement failure (Figure 1). These locations are indicated as △4 in Exhibit A. Additionally, there are multiple large areas located in some of the drive aisles of the parking lot, the drop-off loop, an access drive to the athletic field at the east of the site, and where the busses pick-up and drop off that are showing signs of subgrade failure and substantial pavement degradation (Figure 2). There are also two distinct areas along the north entrance roadway to the drop-off loop that have no pavement for the entire width of the roadway with exposed aggregate in a severe depression. These areas are indicated as △5 in Exhibit A.

The concrete curbing along the perimeter of the parking area has a few spans throughout that are damaged or missing (Figure 3) and are indicated as △6 in Exhibit A.

Much of the concrete sidewalks around the exterior of the building are in fair condition, with a few sidewalk panels that are cracked or have deteriorating joints throughout the site – mainly in the interior courtyard area (Figure 4). The various locations are shown as 7 in Exhibit A. A few of the existing concrete steps at access points to the building showed signs of deterioration from age, cracks, and riser nosing chips (Figure 4). These locations are shown as 8 in Exhibit A.

An existing pedestrian drain cover in a concrete slab adjacent to an ingress/egress doorway in the interior courtyard displays severe structural deficiencies and the concrete slab is set with large slopes making entry to the door difficult (Figure 5). This location is indicated as 9 in Exhibit A.

The rubber play surfacing at the two playground locations on the school grounds are covered in dirt and debris, and show signs of minor surface deficiencies that may become larger without preventative maintenance, cleaning, and repairs per the play surface manufacturer's recommendations (Figure 6). These locations are indicated as 10 in Exhibit A.

b. DRAINAGE

The site appeared to drain relatively well via sheet flow to a network of predominantly curb inlets within the pavement and parking areas. Overall the curb inlets were in relatively good condition, with a few noted exceptions. There are areas of the site that do not have positive drainage or a drainage collection system. There does not appear to be any stormwater management onsite for quality or quantity control. The site appears to be divided into three drainage areas:

1. Mt Vernon Avenue Drainage Area
   The front (west) of the school is very flat and drains poorly to the Mt. Vernon Avenue drainage system. There is one inlet in the front yard area which is clogged and the open space is not graded for positive flow to the inlet. It is likely that significant ponding occurs in the front green space. The front walkways of the school have no inlets and sheet flow towards the road, but there is likely ponding on the walkways as well. The front courtyard contains one inlet, but there is no positive flow of the courtyard area to the inlet. The south frontage of the school also drains to several inlets which appear to tie into the Mt. Vernon Avenue drainage system as well. The southern courtyard contains a landscape infiltration area and several inlets which appeared to be clogged. Roof leaders in the side courtyard were not connected to the downspouts.

   The north side of the school and front drive have no storm drainage and do not have positive flow away from the building or down the drive. Water collects at a low point in the driveway area. The building engineer indicated that there is water intrusion on the north side of the building, which is consistent with the findings.

2. E. Glendale Avenue Drainage Area
The rectangular fields and tennis courts do not appear to have any storm drainage. The tennis courts and northern halves of the fields eventually sheet flow to the E. Glendale Avenue drainage system. However, there are several low areas around the fields that collect significant areas of runoff and will pond significantly before overflowing into the road system. It is likely that the tennis court ponds as well.

3. E. Braddock Road Drainage Area
The back of the school (east side), bus loop, parking areas and south ballfields appear to outfall to a ditch along the east edge of the property along the Potomac Yard Park trail and into an inlet just north of E. Braddock Road. The front of the school has several curb inlets that require maintenance. There are low spots within the parking lots and bus loop which likely collect water. The building engineer indicated a problem with ice, which would be consistent with the low points in the parking areas. The inlets in the main back entrance need to have positive drainage to them. The southern ballfields are very flat, with several low spots. They likely do not drain well and pond during rain events prior to positive outfall to the ditch.

GEORGE WASHINGTON - RECOMMENDATIONS

A. 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

B. MECHANICAL

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

C. 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

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. CIVIL

a. PAVEMENT

- We recommend performing all pedestrian access pavement and play area walkway repairs/replacements during Phase 1 (Civil) with the following scope:

    - Priority 2: Replace cracked/damaged concrete sidewalk panels along pedestrian walkways and within the interior courtyard.
    - Priority 2: Patch or replace existing concrete steps that are cracked, missing chunks of concrete, and have significant surface and riser nosing wear from age.
    - Priority 2: Replace the existing structurally deficient pedestrian drain cover and concrete slab with a product that is more suitable for that location near an ingress/egress doorway.
    - Priority 4: Clean and perform manufacturer's recommended maintenance of existing rubber play surfacing at the two playground locations to provide safe and clean play surfaces while extending the life of the surfacing.
    - Priority 4: Perform full depth pavement repair at the two severely damaged pavement locations that span the width of the roadway at the north side of the school along the drop-off loop entrance road.
- We recommend performing all vehicular pavement and curbing repairs/replacements during Phase 2 (Civil) with the following scope:
    - Priority 4: All areas with subgrade failure and major pavement deterioration shall receive full-depth asphalt pavement replacement.
    - Priority 4: All areas exhibiting minor surface cracks and missing/damaged surface pavement shall be milled and overlaid.
    - Priority 4: All missing or faded striping should be replaced.
    - Priority 4: Crack seal or replace existing cracked colored asphalt tennis court pavement on the sloped edge (based on further subgrade investigation).

b. ACCESSIBILITY

There are little to no access routes to the building or the site which are compliant with the requirements of the Americans with Disabilities Act (ADA).

- Priority 2: The ADA parking stalls on the east side of the building do not have compliant cross slopes or signage, are not the required size and do not have a compliant route into the building
- Priority 3: The ADA parking stalls on the south side of the building do not have compliant size or signage and do not have an accessible route into the building.
- Priority 3: The tennis courts do not have an accessible route to the building or the parking area.
- Priority 2: There is not an accessible route into the building from any public right-of-way. The access from E. Glendale Avenue has curb ramps that are non-compliant however the rest of the route is compliant. This can be corrected with minor construction.
- Priority 3: The bleachers at the westernmost grass rectangular field are ADA compliant however there is no compliant access to the bleachers. The track which appears to be used for access has cross slopes that exceed allowable thresholds.

- Priority 3: The northern enclosed courtyard has seating area for an outdoor learning space however there is no accessible access to the courtyard and there is no ADA compliant seating.
- Priority 3: There are several walkways along the southern side of the building that have ramps. None of these ramps are compliant. if it is determined that the doors should have ADA compliant egress, the ramps should be reconstructed.

c. DRAINAGE

Priority 1: Storm Drain Cleaning

- Fix erosion issues along Potomac Yard Park ditch
- Clean inlet at the downstream end of Potomac Yard Park Ditch
- Define swale and create positive drainage to inlet downstream of the southern courtyard area
- Fix roof leaders and downspouts in courtyard areas
- Create positive flow to the rain garden
- Clean out grates in front of doors within the southern courtyard
- Clean out drain at the bottom of the stairs along the south side of the building
- Clean out the inlet in the front yard and front courtyard areas
- Replace damaged inlet in courtyard area south of main entrance, lower grate top elevation
- Create positive flow within the front yard area to the existing inlets
- Create positive flow from condensation drains along all side of the building
- Lower grate top of inlet within courtyard north of the main entrance and regrade area for positive flow
- Clean out drain at the bottom of stairs along the courtyard area north of the main entrance
- Potentially create a series of drains to collect the front entrance area drainage to alleviate flooding of the walkways
- Regrade north drive area to alleviate low spots and create positive flow
- Use a series of yard inlets to collect drainage along the north side of the building to prevent ponding and water intrusion
- Repair or replace damaged curb inlets within parking and paved areas. Clean out all curb inlets
- Connect roof leader to header pipe along the east side/back of the building
- Create positive flow to inlet in sidewalk areas of the entrance. Sod areas to alleviate erosion
- Regrade areas of the parking lot to alleviate low points and create positive flow to the curb inlets

Priority 4: Ballfield Regrading

- Fix curb inlet in south parking area adjacent to ballfield
- Regrade ballfield areas for positive drainage and fix low spots
- Replace manhole lid with inlet lid to collect drainage from the low spot and the ballfield adjacent to the intersection of Mt. Vernon Avenue and E. Braddock Road
- Put manhole lid cover back on manhole immediately adjacent to manhole that is suggested to be replaced with inlet cover near southern ballfield
- Fix areas of erosion around ballfield areas
- Install storm drainage around rectangular fields and tennis courts to alleviate ponding
- Repair areas of erosion around fields

PHOTOGRAPHS

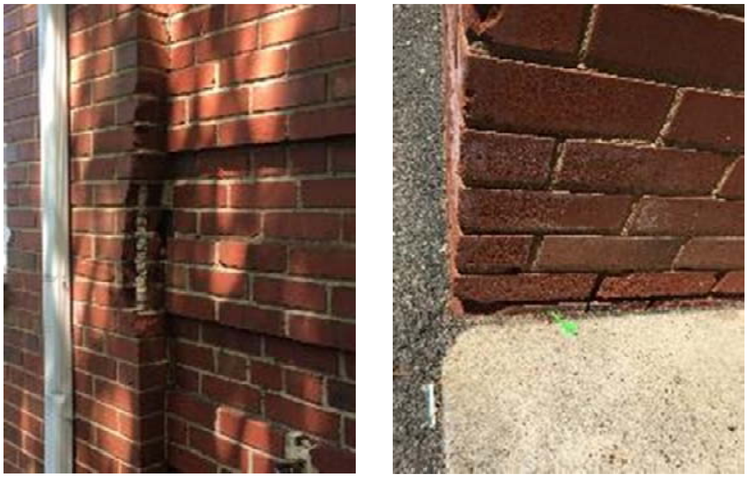


Figure 19: Exterior Walls (weathering and mortar vanishing)

Figure 20: Wood Rot on Windows Due to Moisture

Figure 3: Greywater Collection is Poorly Set

Figure 4: Stormwater Drains at Window Edge

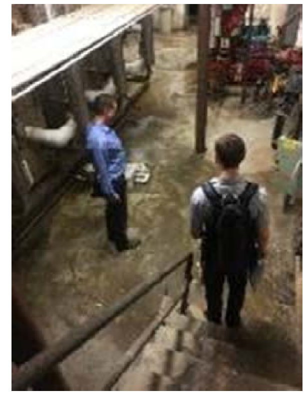


Figure 5: Boiler Room Finishes

Figure 6: Ceiling Stains

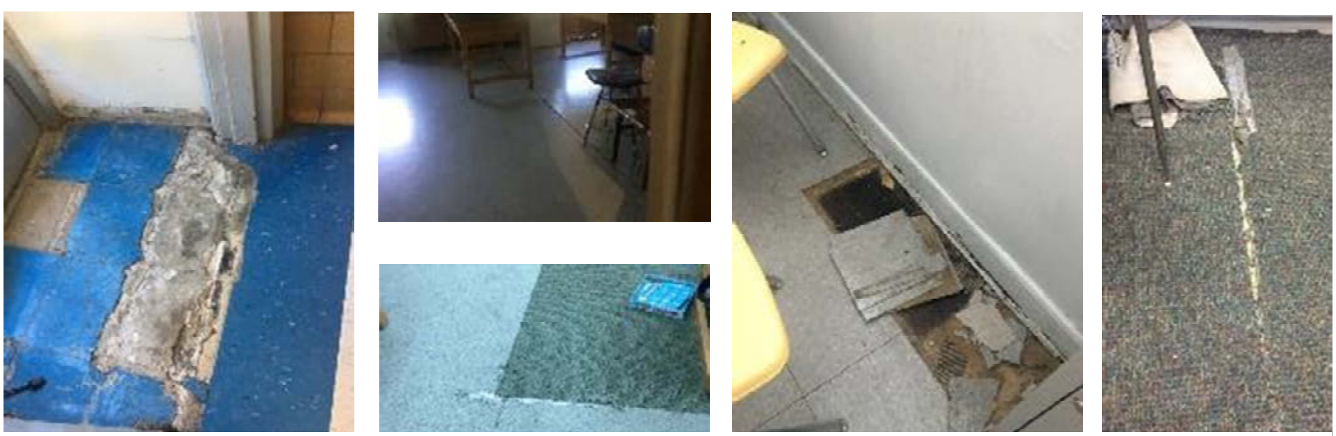


Figure 7: Flooring

Figure 8: Aged Furniture and Counter Laminate

Figure 9: Toilet Room Samples

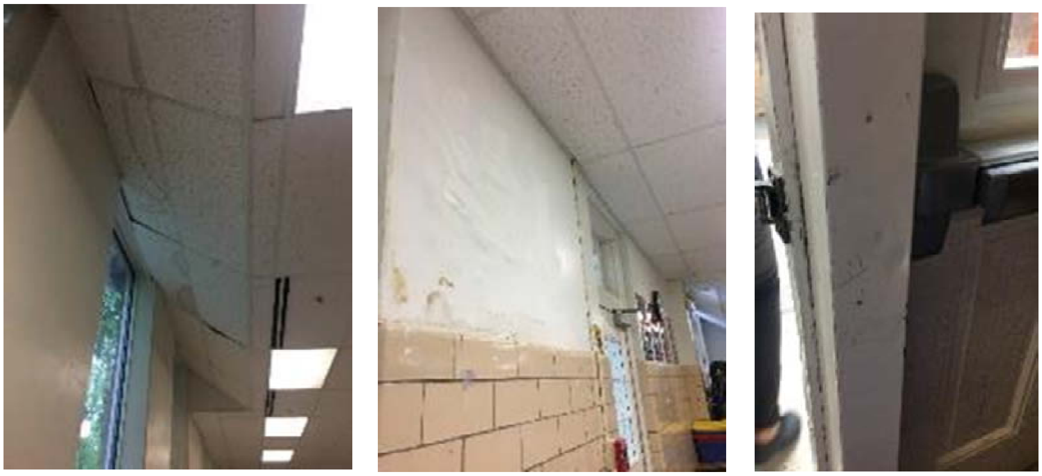


Figure 10: Cafeteria Samples

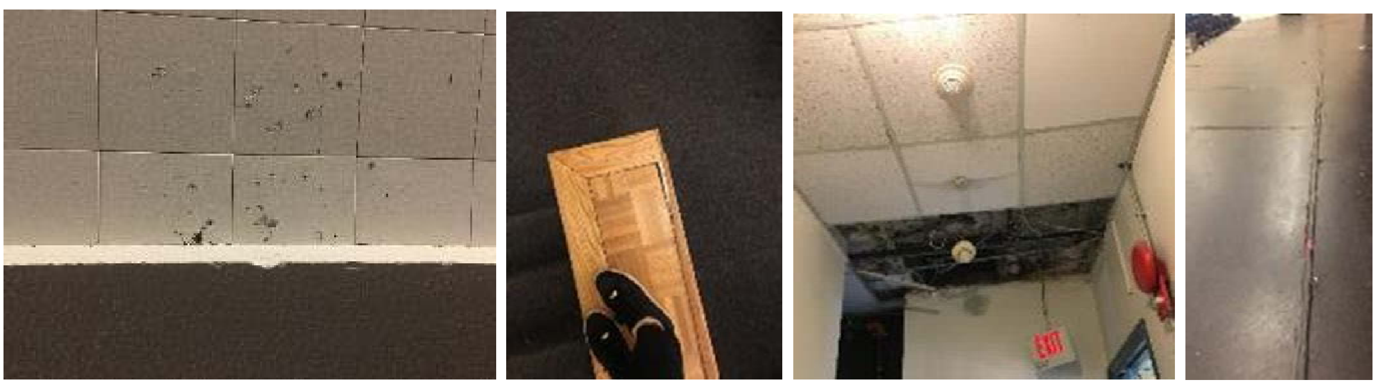


Figure 11: Auditorium Samples

Figure 12: Fan coil unit found in room A113.

Figure 13: Unit ventilator found in room A310.

Figure 14: Daikin cassette in cafeteria.

Figure 15: Vehicular Pavement – Surface Cracking

Figure 16: Vehicular Pavement – Subgrade Failure/Substantial Pavement Deterioration

Figure 17: Vehicular Pavement – Concrete Curbing Damaged

Figure 18: Pedestrian Pavement – Cracked/Deteriorating Concrete Sidewalk Panels and Concrete Steps

Figure 19: Pedestrian Drain Cover and Surrounding Ingress/Egress Slab Deteriorating

Figure 20: Pedestrian Pavement – Rubber Play Surfacing Requiring Maintenance/Cleaning/Repair

Figure 21: Outfall ditch and inlet at E. Braddock Road

Figure 22: Roof Leader in need of repair

Figure 23: Clogged drain at bottom of stairs

Figure 24: Inlet at front of school

Figure 25: Front of school with no positive drainage to inlet

Figure 26: Condensate drains with no positive outfall

Figure 27: Downspout with no connection

Figure 28: Inlet with blockage

Figure 29: Evidence of ponding in main parking lot

Figure 30: Erosion around soccer field

Figure 31: Evidence of ponding north driveway

Figure 32: Outdoor learning area

Figure 33: E. Glendale access route

Figure 34: Mt. Vernon main entrance

Figure 35: Example ramp at south side of building

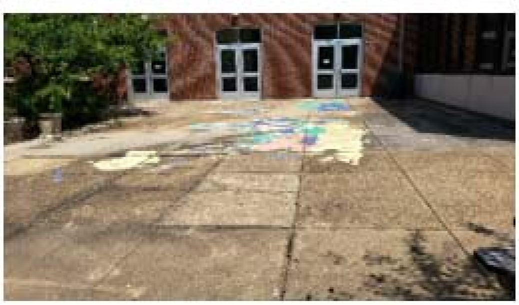


Figure 36: Community garden access

Figure 37: ADA at southern parking lot

Figure 38: ADA parking at main lot

Figure 39: Building access from main lot ADA spaces

Figure 40: Bleacher access

Figure 41: Easternmost field access

ARCHITECTURAL ROOM BY ROOM ANNOTATED SURVEY

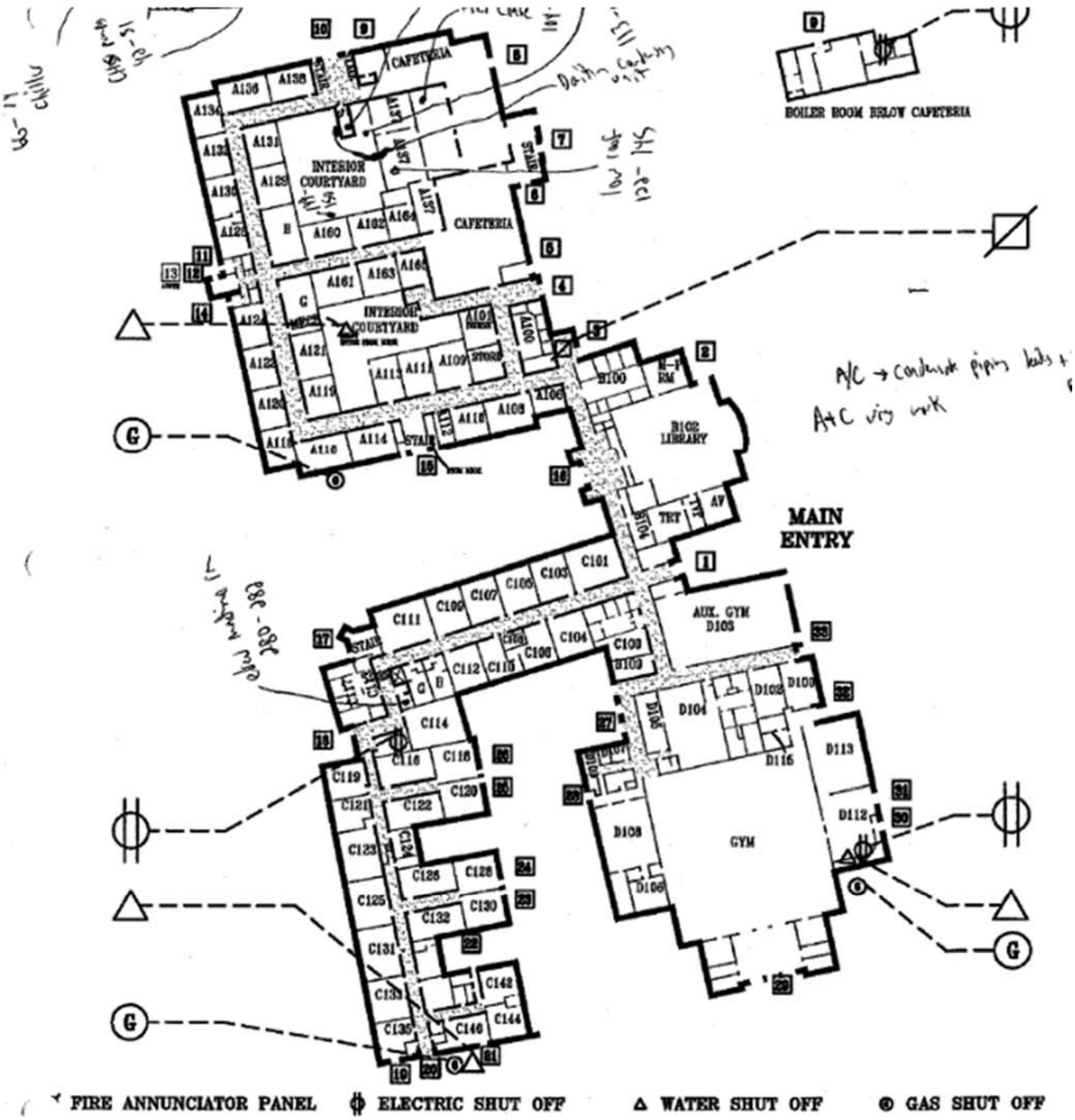
Room	Wall finishes failures	Flooring	Evidence of past leaks; ceiling stains	Wall paint failures	Carpet replacement	Minor finishes	Millwork laminate	No work required	Other...
A308		1					1		
A306		1							
A304									storage in electrical closet
A302						1			door missing to storage
A303				1					
A301				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	

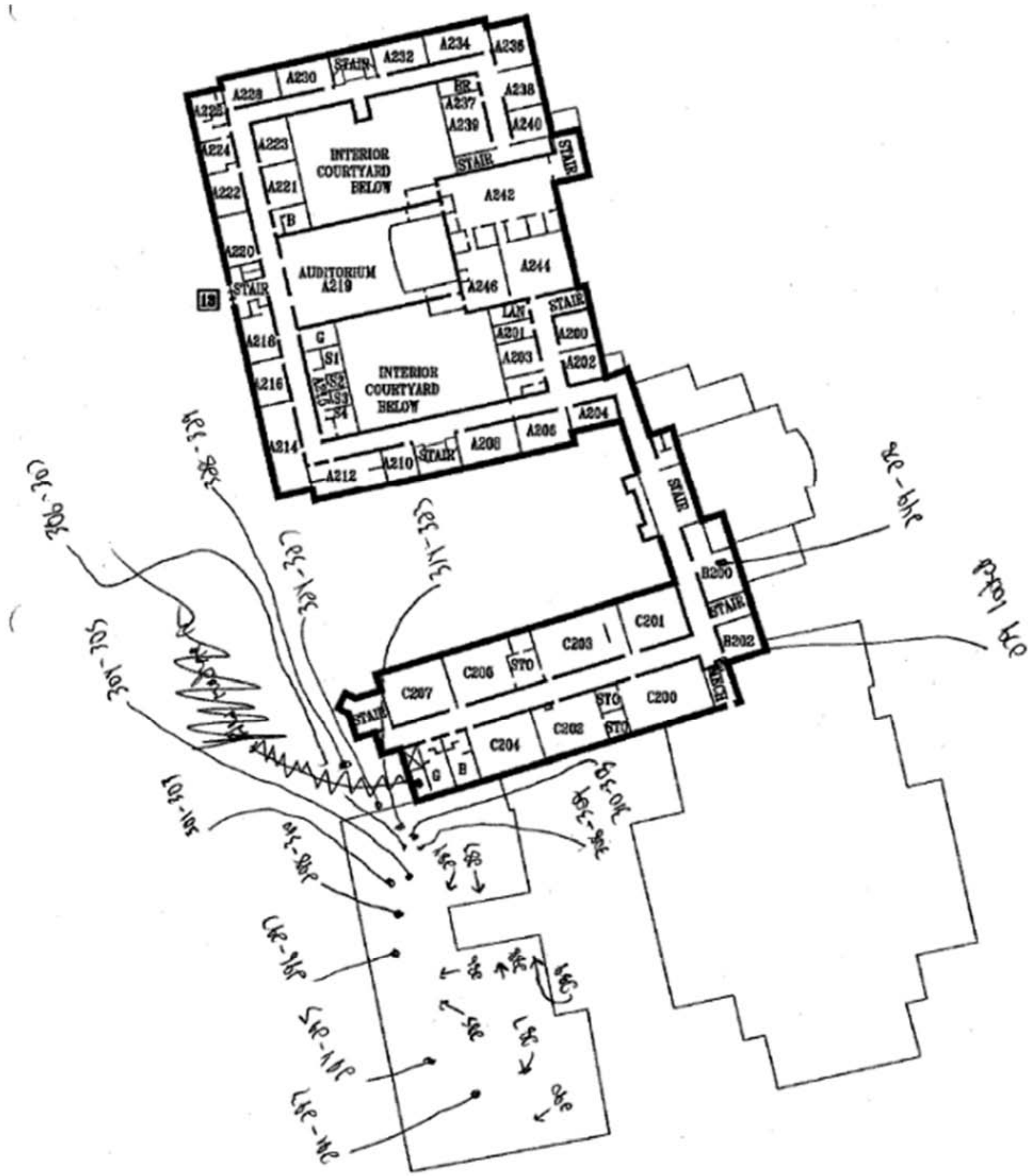
Room	Wall finishes failures	Flooring	Evidence of past leaks; ceiling stains	Wall paint failures	Carpet replacement	Minor finishes	Millwork laminate	No work required	Other...
A237			1						humidity; wood structure
A238			1						flood damage evident
A240			1						
A234			1			1			
A232 L									
A230 L									
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

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AUDITORIUM A219
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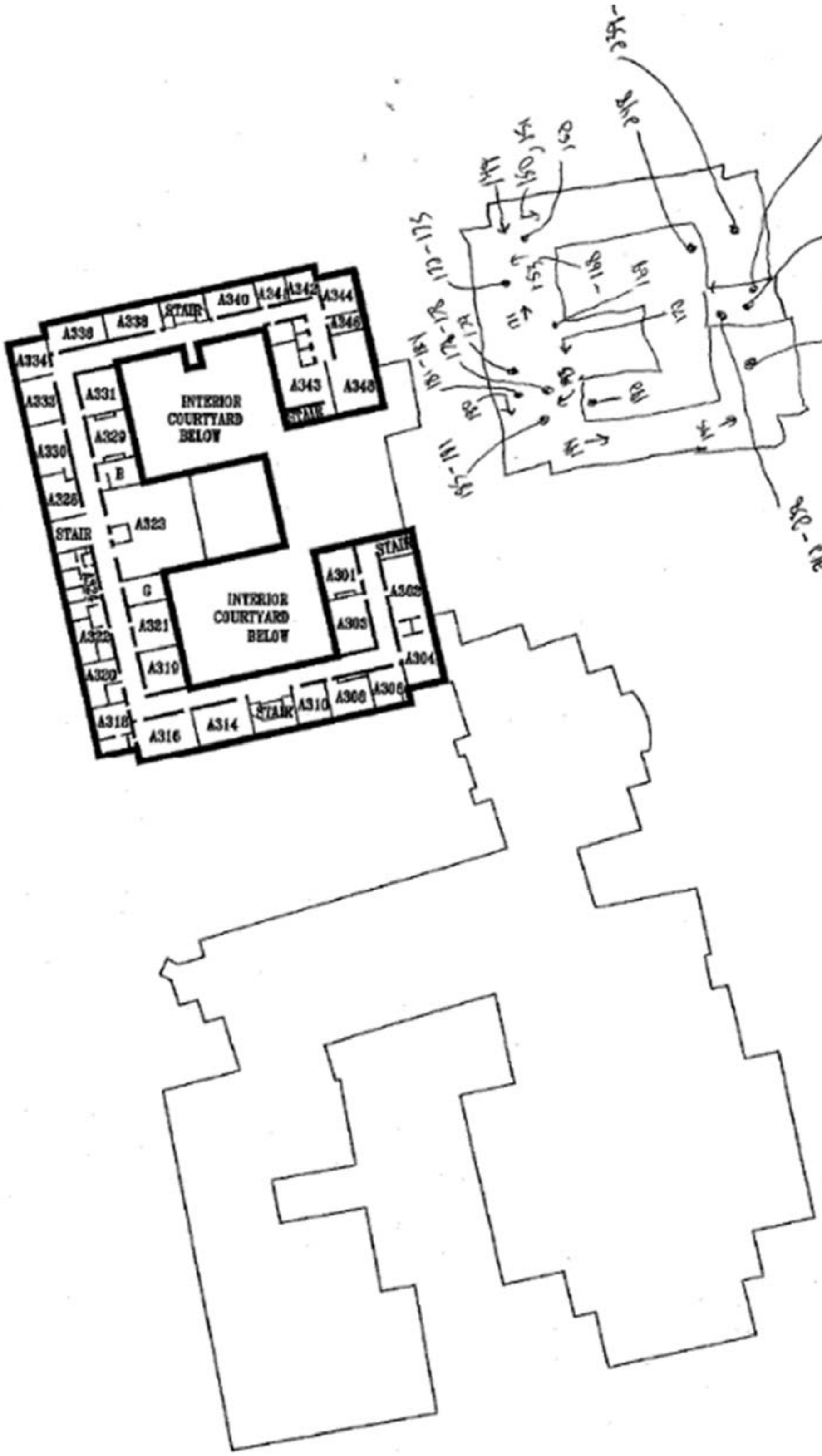
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INTERIOR COURTYARD BELOW
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A302
A303
STAIR
INTERIOR COURTYARD BELOW

ADA 1

1. ADA RAMP SLOPE - NON-COMPLIANT
2. ADA ACCESS ROUTE - NON-COMPLIANT
3. ADA PARKING SPACES - NON-COMPLIANT

PAVEMENT 1

4. SURFACE ASPHALT CRACKING W/ISOLATED SUBGRADE FAILURE AREAS
5. ASPHALT SUBGRADE FAILURE AND SUBSTANTIAL PAVEMENT DETERIORATION
6. DAMAGED/MISSING CURBING
7. CRACKED/DETERIORATED JOINTS ON SIDEWALK CONCRETE PANELS
8. CRACKED/CHIPPED CONCRETE STEPS
9. PEDESTRIAN DRAIN COVER AND SURROUNDING PAVEMENT DAMAGED
10. RUBBER PLAY SURFACING NEEDS MAINTENANCE/CLEANING/REPAIR

DRAINAGE 1

11. DRAIN CLOGGED
12. NO OUTFALL
13. INLET ISSUE
14. LP ISSUE
15. POSITIVE FLOW DRAINAGE ISSUE
16. GC
17. MANHOLE LID OPEN
18. RAIN GARDEN DRAINAGE
19. RAIN BARREL

EXHIBIT A (LEGEND)

CLARK | AZAR & ASSOCIATES

GEORGE WASHINTON MIDDLE SCHOOL

1005 MOUNT VERNON AVE, ALEXANDRIA, VA 22301

1 OF 2

EXHIBIT A

SCALE: 1" = 100'

CLARK | AZAR & ASSOCIATES

2 OF 2

GEORGE WASHINTON MIDDLE SCHOOL
1005 MOUNT VERNON AVE, ALEXANDRIA, VA 22301

EXHIBIT A (CONT.)

SCALE: 1" = 100'

CLARK | AZAR & ASSOCIATES

IIIE- DETAILED BUILDING AND DEFICIENCY DATA

MATTHEW MAURY - GENERAL

A. 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 fascia, 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 room 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 deficiencies are identified in SECTION III. RECOMMENDATIONS.

B. SUMMARY OF FINDINGS

The surveys resulted in discovery of numerous issues and concerns contributing to unsatisfactory conditions within the building. Refer to “DETAILED FINDINGS” for further descriptions. 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 downspouts 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 route 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 windows serve as emergency rescue and 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 age, 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 replaced with resilient flooring.
- There is no connection to elevated spaces for ADA compliance.

C. COSTS

Refer to Section I-D “ACPS Targeted Condition Assessments – Planning Projections” for rough order of magnitude estimates associated with each remediation project identified.

MATTHEW MAURY – DETAILED FINDINGS

A. ARCHITECTURAL

a. ROOFING

- Water retention on roofs causing leaks (Figure 21). 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 22).

A visible deep crack is spotted on the entrance steps. These damaged steps should be rebuilt (Figure 23).

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 24).

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 25). More than five classrooms have aged carpets, which need to be replaced (Figure 26). The gym toilets, kitchen toilet and the boys' toilet are non-ADA complaint. A couple of classrooms need their closet doors and floor to be fixed (Figure 27). A couple of rooms need wall finishing (Figure 28). When the roof, window, and plumbing water infiltration has been mitigated, then ACPS 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.

B. 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.

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

In general, the roof drainage appears to be adequate and is predominantly a roof drain interior piping system, but there are also some areas that consist of gutters and downspouts. These downspouts typically discharge to 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 water heater is located in the basement mechanical space which is a very wet environment. This basement space also houses an old abandoned boiler. The water heater in the basement 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 second water heater is located in a different basement area that is dry. This water heater, however, is beyond its useful life and should be replaced.

The building is fully sprinklered. It was noted that several sprinkler heads need to be provided with proper escutcheons to coordinate with the ceiling tiles.

The Life Safety Code, NFPA 101, Section 15.7.4 limits the placement of paper materials on walls due to flame spread concerns. It was noted that several staff members are taping large sheets of Kraft paper vertically to shelves to protect teaching materials located on the open shelves during the summer break. The thermally thin properties of Kraft paper, when hung in this configuration, can contribute significantly to flame spread and fire growth.

The Life Safety Code, NFPA 101, Sections 10.3.1 and 15.7.4 require draperies, curtains and other similar loosely hanging furnishings and decorations to meet flame spread propagation performance criteria contained in NFPA 701. It was noted that black felt is being used for black-out shades for windows on doors throughout the school. The school should confirm that the felt is of the flame-retardant type.

C. 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”.

The building does not have an emergency generator. 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 appear to be inadequate in some areas to provide the 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.

The very recent construction of a new drywall partition to subdivide faculty offices permanently obstructs access to ceiling mounted 2x4 lensed luminaires. The fluorescent lamps are replaced by swinging open the hinged acrylic panel. The drywall blocks access to the luminaires so that panel will no longer open.

Extension cords are being used in several offices. The National Electrical Code permits the use of extension cords for temporary power only. Additional receptacles should be installed if personnel must resort to long-term use of extension cords.

D. 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 ad death.

During the survey, it was noted that some boxed items stored on shelves obstruct notification appliances. The items should be stored elsewhere.

E. CIVIL

a. PAVEMENT

The school grounds include a loading area with parking and an access road at the rear of the school, various pedestrian access walkways around the building, stone aggregate walkways around the recess and turf field areas, a paved hardscape play area, and a basketball court. (Refer to "Supplemental Information", this chapter, for Exhibit A).

A majority of the asphalt pavement within the rear loading/parking area and access road displayed a sporadic distribution of surface cracking with isolated areas throughout exhibiting subgrade/pavement failure (Figure 1). These locations are indicated as △3 in Exhibit A. Additionally, there is one large area located within the drive aisle (particularly in the vicinity of past underground utility work and subsequent patching) that is showing signs of subgrade failure and substantial pavement degradation (Figure 2). There is also a small area of asphalt pavement missing within the hardscape play area around an existing manhole, which can be a tripping hazard. These areas are indicated as △2 in Exhibit A.

Much of the concrete sidewalks around the exterior of the building were in fair condition, with a few sidewalk panels that were cracked or had deteriorating joints (Figure 3). The various locations are shown as △5 in Exhibit A. A few of the existing concrete steps at access points to the building showed signs of deterioration from age, cracks, and riser nosing chips (Figure 3). These locations are shown as △4 in Exhibit A. Additionally, the main front entrance masonry steps have what appears to be a non-slip/sealant coating that is worn down in some areas, leaving the steps bare and potentially providing a slipping hazard at a major entrance point to the school (Figure 4). This location is indicated as △6 in Exhibit A.

Almost the entire length of the stone aggregate walkway on the school grounds is missing stone and does not have a consistent and level walking surface due to washout and/or uneven settlement (Figure 5). This is especially pronounced at the connection points to the existing concrete sidewalks near the playground entrance as well as where manhole lids and other appurtenances are within the walkway limits. In some areas, the subgrade filter fabric has been pulled up out through the surface. These areas are indicated as △1 in Exhibit A.

b. ACCESSIBILITY

There are some areas of the site that are compliant with the Americans with Disabilities Act (ADA) requirements however there are several that are not as indicated below:

- The ADA parking stalls on the west side of the building do not have compliant cross slopes or signage, are not the required size, and do not have a compliant route into the building.
- The sidewalk from the road toward the main entrance is not fully compliant. The sidewalk that runs along the front of the school is not fully compliant due to cross slope issues and does not connect to the public right-of-way in a compliant manner.
- The fenced in grass play area is not ADA compliant from the building and the seating in the play area is not compliant. There are no ADA seating spaces at the tables.
- The play equipment did not have an ADA accessible route due to the displacement of the engineered wood fiber safety surfacing

c. DRAINAGE

The overall site drainage is poor with all inlets onsite requiring cleaning and repairs/ replacement. There are extensive areas that do not have positive outfall and significant areas of erosion. The site is very tight and from preliminary observation of the depths of the inlets, constructing additional inlets in the areas without storm drainage would be challenging and may not have positive outfall. The lack of storm drainage and positive outfall likely leads to icy conditions in the winter. The site appears to have two drainage areas:

1. Johnson Place Drainage Area

   The intention is for the back (west) and side (south) areas of the school site to drain to inlets within the back driveway. However, those inlets are clogged and large areas of grass and pavement do not have positive drainage to the inlets. The hill in the southwest corner of the site drains into the driveway with no positive outfall. Roof leaders in the back also discharge to grade with no positive outfall to collection inlets. There is significant erosion in the garden areas. This area drains to a stormwater management facility that is in relatively good condition.

2. Russell Road Drainage Area

   The remainder of the site, north and east portions, appear to drain to the Russell Road drainage system. The front (east) of the building sheet flows with no controls to curb inlet within the Russell Road right-of-way. There are low spots that collect drainage in front of the school and roof leader that do not have positive outfall away from the building. There is no storm drainage in the courtyard area. The playground has a concrete edge that allows water to pond without positive discharge. The trench drain adjacent to the playground is completely clogged. There is a stormwater management facility along the northeast property line that requires maintenance. There are areas of significant erosion along the north property lines and around the playground. There are also areas of grass pave that may provide some infiltration.

MATTHEW MAURY - RECOMMENDATIONS

A. 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

- Remove 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

B. MECHANICAL

Priority 1

- Direct roof drain piping discharge away from the building to prevent water infiltration at the foundation.
    - Deficiency Category: Energy, Functionality, Building Integrity
- 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

- 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 piping removed.
    - Deficiency Category: Energy, Functionality

C. 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

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. CIVIL

a. PAVEMENT

- We recommend performing all pedestrian access pavement and play area walkway repairs/replacements during Phase 1 (Civil) with the following scope:
    - Priority 2: Patch or replace existing concrete steps that are cracked, missing chunks of concrete, and have significant surface and riser nosing wear from age.
    - Priority 2: Re-apply non-slip/sealant coating to masonry steps at the main front entrance of the school.
    - Priority 3: Fill in gap in asphalt hardscape play area around manhole.
    - Priority 3: Replace the stone aggregate that has washed out from the walkways on the school grounds to provide an even walking surface throughout and to be flush with existing manholes and appurtenances within the walkway. Additionally, we recommend that the entire length of the stone aggregate walkway have an edging installed on the downhill edge of the walkway path to avoid future washout and depletion of walkway stone aggregate.
    - Priority 3: Replace cracked/damaged concrete sidewalk panels along pedestrian walkways.
- We recommend performing all vehicular pavement and curbing repairs/replacements during Phase 2 (Civil) with the following scope:
    - Priority 4: All areas with subgrade failure and major pavement deterioration shall receive full-depth asphalt pavement replacement.
    - Priority 4: All areas exhibiting minor surface cracks and missing/damaged surface pavement shall be milled and overlaid.
    - Priority 4: All missing or faded striping should be replaced.

b. ACCESSIBILITY

- Priority 2: Replace the sidewalk coming from the street up to the site on the southern end of the building with a compliant section of sidewalk.
- Priority 2: Replace sidewalk panels along the frontage of the building that have compliant cross slopes
- Priority 2: Provide ADA compliant parking stalls that include appropriate signage, slopes, and size.
- Priority 2: Provide an accessible route into the building from the ADA parking stalls
- Priority 3: Provide additional engineered wood fiber to provide adequate safety surfacing under the playground.

c. DRAINAGE

Priority 1: Drainage Maintenance:

- Clean out and repair/replace all inlets onsite
- Regrade back driveway and courtyard to provide positive drainage to inlets from surface runoff and roof leaders. Provide additional inlets if invert allows

- Repair damaged roof leaders all around building
- Clean out all trench drains
- Clean out stormwater management facility riser structure and maintain facility
- Create positive drainage from roof leaders in the front of the building away from the building towards the Russell Road inlets. Provide yard inlets to collect drainage in the courtyard and front of the building if outfall into those right-of-way inlets is available
- Repair downspouts from rain barrels

Priority 4: Miscellaneous Erosion Mitigation:

- Repair and stabilize areas of erosion
- Raise mulch elevation of playground to top of surrounding curb to provide positive drainage to the trench drain on the east side of the playground
- Provide stabilization around playground
- Provide positive drainage to inlets in playground area
- Consider infiltration under the playgrounds
- Provide positive drainage under foot bridge at the northeast corner of the site

PHOTOGRAPHS

Figure 1: Roof leaks



Figure 2: Exterior coping

Figure 3: Crack on the entrance steps

Figure 4: Window frames


EXIT

Figure 5: Ceiling stains

Figure 6: Cracked floor

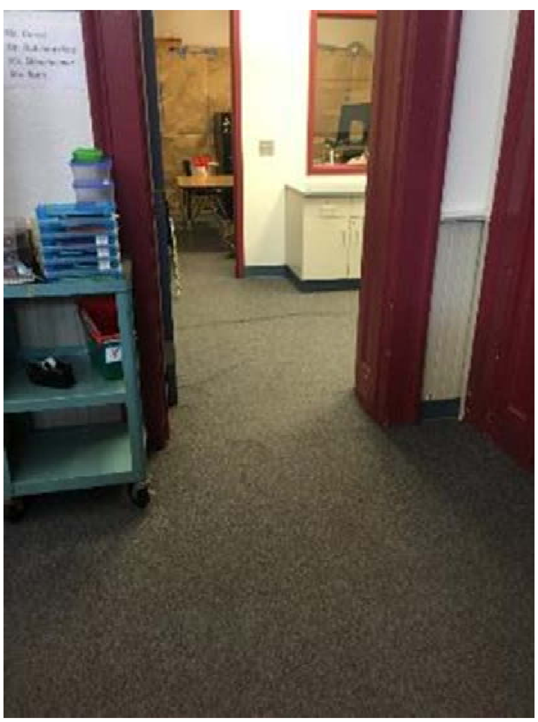


Figure 7: Carpet

Figure 8: Wall finishes

Figure 9: Permanently obstructed 2x4 luminaires

Figure 10: Box obstructing fire alarm strobe

Figure 11: Kraft paper covering shelves

Figure 12: Sprinkler improperly installed above ceiling tile

Figure 13: Kraft paper covering shelves

Figure 14: Felt curtains

Figure 15: Prolonged extension cord use

Figure 16: Vehicular pavement surface cracking

Figure 17: Vehicular pavement subgrade failure/substantial pavement deterioration

Figure 18: Cracked/deteriorating concrete sidewalk panels and concrete steps

Figure 19: Worn non-slip/sealant coat on masonry steps

Figure 20: Stone aggregate walkway (additional stone required)

Figure 21: Access from road

Figure 22: Fenced play area and seating

Figure 23: Sidewalk panel slopes at front of building

Figure 24: Playground access via front sidewalk

Figure 25: Playground

Figure 26: Clogged inlet

Figure 27: Clogged opening under bridge

Figure 28: Area of erosion near field

Figure 29: Area of erosion in garden area

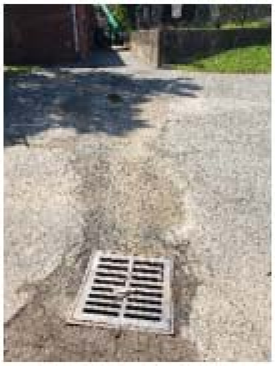


Figure 30: Evidence of ponding in parking area

Figure 31: Roof leader requiring maintenance

Figure 32: Area of erosion in back of school

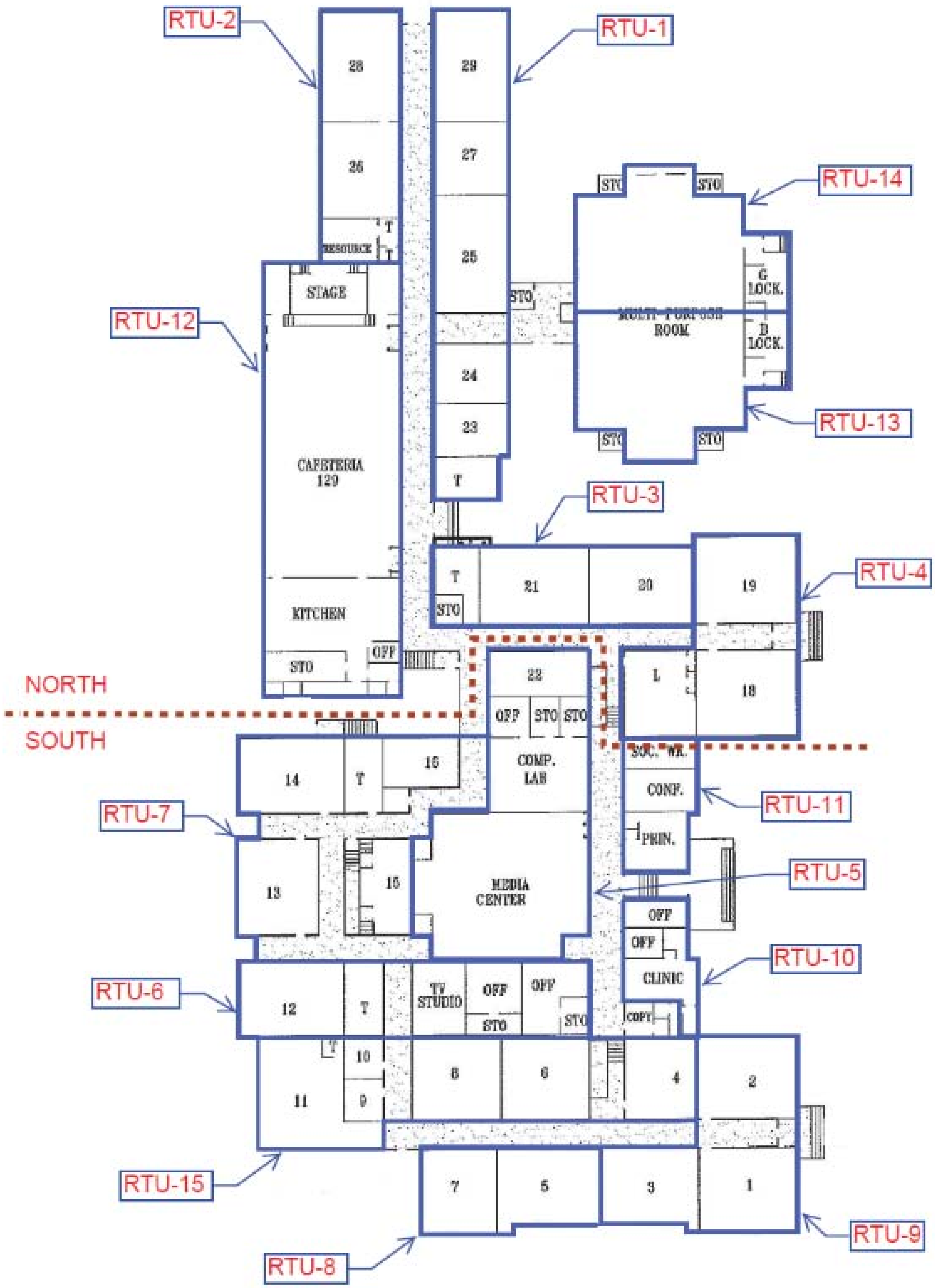
Figure 33: Clogged trench drain at playground

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



PAVEMENT 1

1. AGGREGATE WALKWAY REQUIRES ADDITIONAL STONE
2. ASPHALT SUBGRADE FAILURE AND SUBSTANTIAL PAVEMENT DETERIORATION
3. SURFACE ASPHALT CRACKING W/ISOLATED SUBGRADE FAILURE AREAS
4. CRACKED/CHIPPED CONCRETE STEPS
5. CRACKED/DETERIORATED JOINTS ON SIDEWALK CONCRETE PANELS
6. WORN NON-SLIP/SEALANT COAT ON MASONRY STEPS

ADA 1

7. ADA NON-COMPLIANT SLOPE
8. NO ADA ACCESS ROUTE

DRAINAGE 1

9. EROSION
10. INLET ISSUE
11. DRAIN CLOGGED
12. RL ISSUE, NO OUTFALL
13. SWM MAINTENANCE NEEDED
14. GRASS PAVERS NOT INFILTRATING
15. STANDING WATER
16. POSITIVE DRAINAGE FLOW ISSUE
17. MORE SPACE UNDER BRIDGE
18. CLEAN TRENCH DRAIN
19. TURF FIELD

MISCELLANEOUS 1

20. PLAYGROUND MATS BY SWINGS - TRIP HAZARD

EXHIBIT A (LEGEND)

CLARK | AZAR & ASSOCIATES

MATTHEW MAURY ELEMENTARY SCHOOL
600 RUSSELL RD, ALEXANDRIA, VA 22301

1 OF 2

EXHIBIT A

SCALE: 1" = 60'

CLARK | AZAR & ASSOCIATES

MATTHEW MAURY ELEMENTARY SCHOOL
600 RUSSELL RD, ALEXANDRIA, VA 22301

2 OF 2

EXHIBIT A (CONT.)

SCALE: 1" = 60'

CLARK | AZAR & ASSOCIATES

IIIF- DETAILED BUILDING AND DEFICIENCY DATA

TRANSPORTATION FACILITY - GENERAL

A. 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.

B. 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 typical 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 in front of and around 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 plates.

C. 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.

D. COSTS

Refer to Section I-D “ACPS Targeted Condition Assessments – Planning Projections” for rough order of magnitude estimates associated with each remediation project identified.

TRANSPORTATION FACILITY – DETAILED FINDINGS

A. 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 a 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. 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.

B. 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.
- The facility is protected by an automatic sprinkler system.

C. 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 in front of electrical equipment is being used for storage. Stored material does not maintain code required access and working clearances in front of electrical distribution equipment.

Receptacle outlets throughout the dispatch office, training room, administrative offices, private offices and other 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 liquid 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.

D. 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.

E. CIVIL

a. ACCESSIBILITY

There are little to no access routes to the building or the site which are compliant with the requirements of the Americans with Disabilities Act (ADA).

- The ADA parking stalls on the north side of the building do not have compliant cross slopes or signage, are not the required size and do not have a compliant route into the building

- The existing ramp on the north side of the building for access is not compliant with slope requirements, railings or width.
- The ADA parking stalls near the main entrance are not compliant with size or signage and do not have an access route into the building.
- There is not an accessible route into the building from any public right-of-way.
- The sidewalk on the northside of the parking lot near the fueling station that leads to the park is not compliant for cross slope, ramps or obstruction due to heaved and cracked panels.

b. DRAINAGE

Overall the drainage on the site was acceptable with no obvious deficiencies and in talking with the facilities staff, no problems were evident with the site drainage. There was a subsurface water intrusion issue being investigated due to a crack in the foundation. This water intrusion likely relates to ground water and not surface water. There were no grading issues evident in the area of the crack in the foundation. All observed storm drain structures appeared to be clean and open with no obvious obstructions.

c. PAVING

The paving around the site in general was degraded, however, in only a few places had it failed. A more detailed description is below. Overall the sidewalks were in good condition, with only some panels that needed to be replaced.

- The parking area and drive aisle on the north side of the building was in good overall condition with very little signs of subgrade failure. The surface course was degraded slightly, but not in need of a resurfacing at this stage.
- The bus parking area to the west of the building has extensive surficial cracking that cannot be repaired by crack sealing. A resurfacing would be necessary to add meaning life to the paving section.
- The parking area on the south side of the building showed signs of severe cracking with some very localized signs of subgrade failure. Some patching of the paving has recently been done. This parking area would require small areas of full depth patch and a resurfacing.
- The sidewalk at the front of the building has some panels that are damaged. Approximately eight panels centered on the main entrance need replacement.

d. SPECIAL CONSTRUCTION/MISCELLANEOUS SITE FEATURES

The exterior concrete stairs on the north side of the building did not have compliant handrails due to spacing. A center rail should be provided.

TRANSPORTATION FACILITY - RECOMMENDATIONS

A. 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.

B. 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

C. 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

D. 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

E. 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

F. CIVIL

Priority 3: PAVEMENT

- Mill and overlay the bus parking lot on the west side of the parking lot to extend the life of the current asphalt paving
- Provide localized full depth patch of the parking lot on the southern side of the building and mill and overlay of the entire parking lot.
- Provide localized full depth patch of the fueling station asphalt paving and mill and overlay of the entire asphalt paved area to extend the life of the existing paving section.

Priority 2: ACCESSIBILITY

- Priority 2: Install new ADA compliant parking spaces in the passenger vehicle parking lot on the north side of the building.
- Install a new ADA compliant access route into the building from the ADA parking stalls.
- Construct a new ADA compliant access path into the building from a public right-of-way into one of the building entrances

PHOTOGRAPHS

Roof

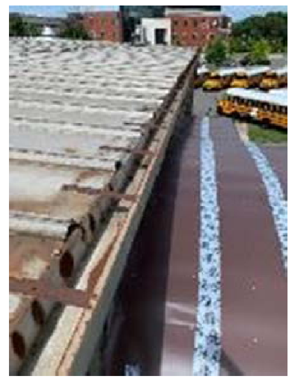


Figure 1. *Roof – Leaks, corroded seams and surfaces, gutter detail and incomplete canopy*

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

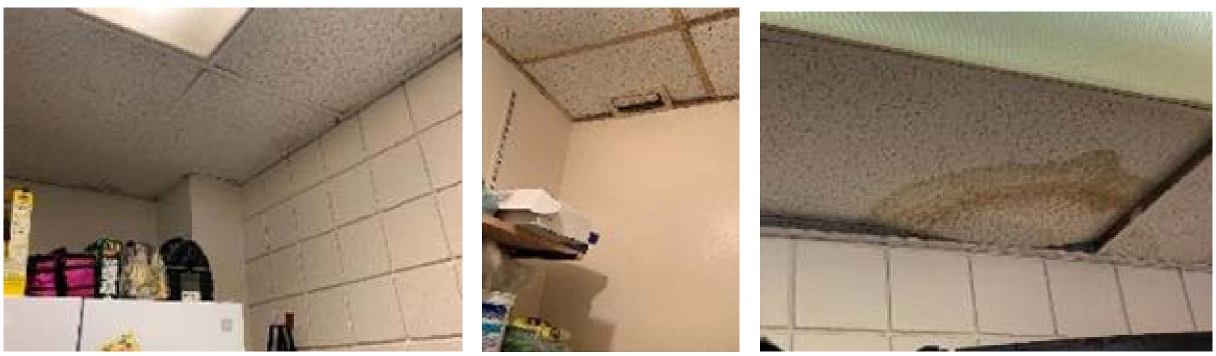


Figure 6: Examples of roof leaks and damaged ceiling tiles throughout upper level

Figure 7: Entry area - Damaged floor tiles

Lower Level

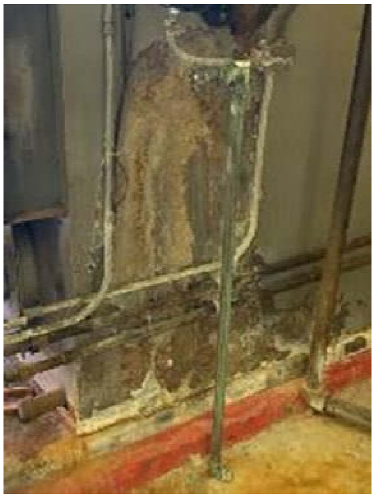


Figure 8: Example of ground water infiltration in utility and bus bays

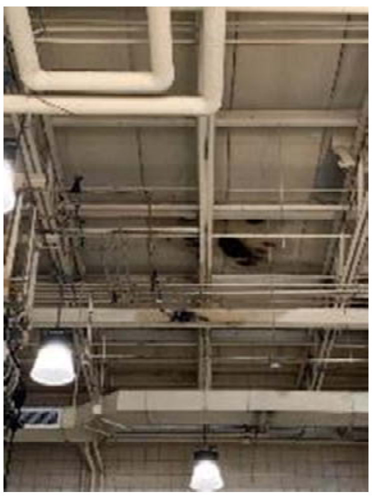


Figure 9: Example of leaks prevalent in high bus bays

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

Figure 15: SPOT COOLER

Figure 16: SPLIT SYSTEM AIR CONDITIONER

Figure 17: UNIT HEATER

Figure 18: BOILER

Figure 19: ADA parking stalls

Figure 20: ADA parking signage

Figure 21: ADA access to building

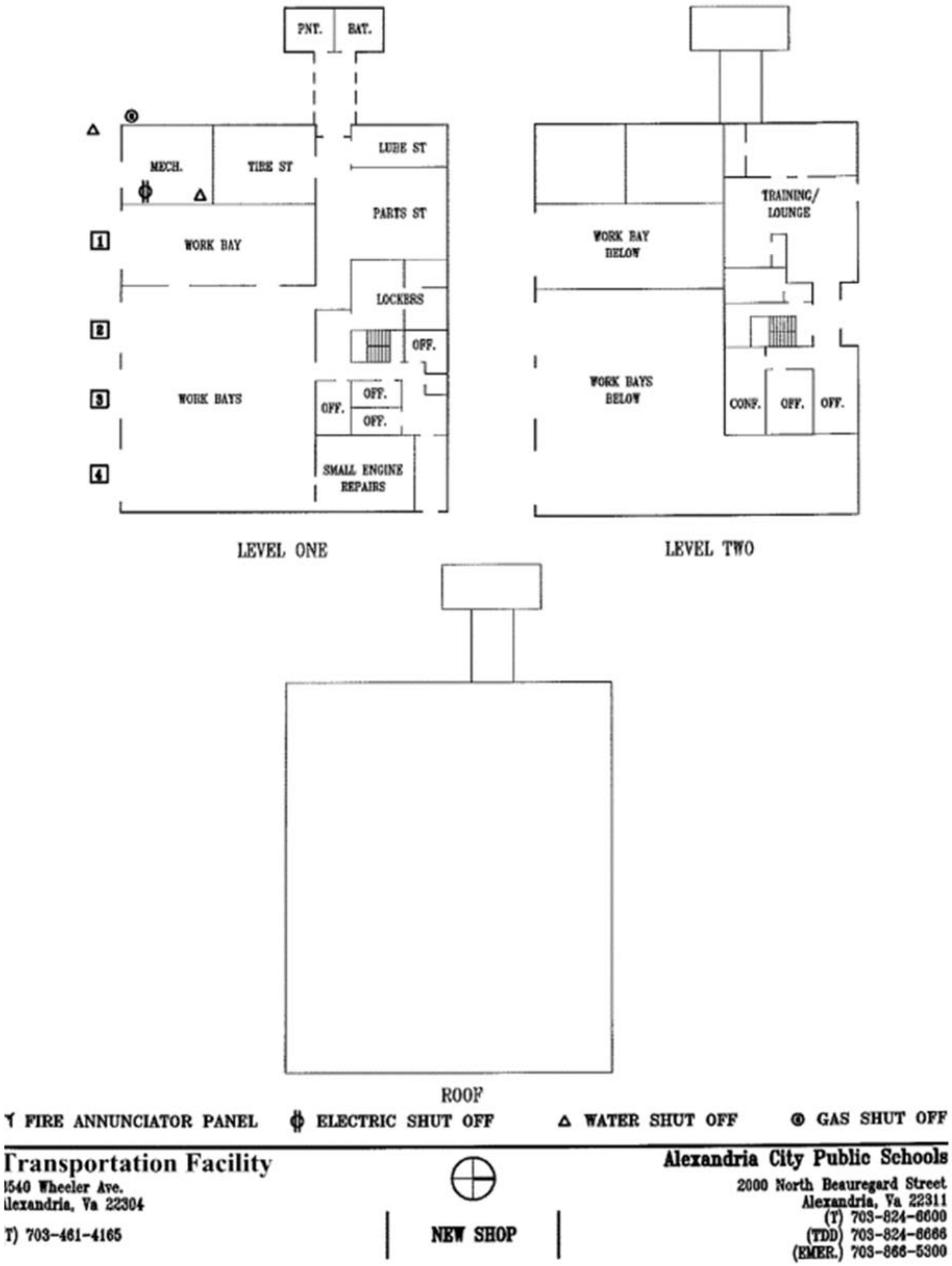
Figure 22: Sidewalk near fueling station

Figure 23: Southwest panel failure

Figure 24: Bus parking areas

Figure 25: South parking area pavement deterioration

FLOOR PLAN DIAGRAMS



ADA 1

1. ADA ACCESS ROUTE- SIDEWALK NON-COMPLIANT
2. RAMP SLOPE NON-COMPLIANT
3. ADA PARKING SPACES NON-COMPLIANT

PAVEMENT 1

4. MILL AND OVERLAY NEEDED
5. SUBGRADE FAILURE- REPLACE PAVEMENT
6. CONCRETE PANEL IN NEED OF REPAIR

MISCELLANEOUS 1

7. MINOR EROSION

EXHIBIT A (LEGEND)

CLARK | AZAR & ASSOCIATES

1 OF 2

TRANSPORTATION FACILITY
3540 WHEELER AVE, ALEXANDRIA, VA 22304

EXHIBIT A

SCALE: 1" = 60'

CLARK | AZAR & ASSOCIATES

TRANSPORTATION FACILITY
3540 WHEELER AVE, ALEXANDRIA, VA 22304

2 OF 2

EXHIBIT A (CONT.)

SCALE: 1" = 60'

CLARK | AZAR & ASSOCIATES

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:**

Facility	On-Site Date	Date of Report
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:

Facility	Date of Report
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:

Facility	Date of Report
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:

Facility	Date of Report
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:

Facility	Date of Report
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:

Facility	Date Certificate Expires
Cora Kelly Elementary School	
• Wheelchair Lift	Lift Certificate not available
Francis C. Hammond Middle School	
• Elevator No. 1	March 31, 2019
• Elevator No. 2	March 31, 2019
• Elevator No. 3	March 31, 2019
• Elevator No. 4	March 31, 2019 (Lift Certificate)
George Mason Elementary School	
• Elevator No. 1	November 30, 2018
George Washington Middle School	
• Elevator No. 1	March 31, 2019
• Elevator No. 2	March 31, 2019
• Elevator No. 3	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.:

Facility	Date of Report
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 :

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

APPENDIX B - ELEVATOR CERTIFICATES

CITY OF ALEXANDRIA

Department of Code Administration
301 King Street, Room 4200
Alexandria, Virginia 22314

ELEVATOR CERTIFICATE

CASE NUMBER: **ELV2018-01015**
DATE CERTIFICATE EXPIRES: **03/31/2019**
SITE ADDRESS: **4646 SEMINARY RD**
OWNER: **ALEXANDRIA PUBLIC SCHOOLS**

ELEVATOR NO: **1**
TYPE OF CONVEYANCE: **ELEVATOR**
TYPE OF PROPULSION: **HYDRAULIC**
FREIGHT/PASSENGER: **PASSENGER**
MAXIMUM CAPACITY - WEIGHT: **3500** lbs
MAXIMUM CAPACITY - PASSENGERS: **23** (Including Operator)

This is to certify that the conveyance described above has been duly inspected and reported to be in safe condition.

By: ______________________

Gregg Fields
Director

THIS CERTIFICATE MUST BE FRAMED AND PLACED IN A CONSPICIOUS LOCATION FOR CONVEYANCE.
IN CASE OF ACCIDENT, NOTIFY CODE ADMINISTRATION 703.746.4200

CITY OF ALEXANDRIA

Department of Code Administration
301 King Street, Room 4200
Alexandria, Virginia 22314

ELEVATOR CERTIFICATE

CASE NUMBER: **ELV2018-01874**
DATE CERTIFICATE EXPIRES: **03/31/2019**
SITE ADDRESS: **4646 SEMINARY RD**
OWNER: **ALEXANDRIA PUBLIC SCHOOLS**

ELEVATOR NO: **2**
TYPE OF CONVEYANCE: **ELEVATOR**
TYPE OF PROPULSION: **TRACTION**
FREIGHT/PASSENGER: **PASSENGER**
MAXIMUM CAPACITY - WEIGHT: **2000** lbs
MAXIMUM CAPACITY - PASSENGERS: **13** (Including Operator)

This is to certify that the conveyance described above has been duly inspected and reported to be in safe condition.

By: ______________________

Gregg Fields
Director

THIS CERTIFICATE MUST BE FRAMED AND PLACED IN A CONSPICIOUS LOCATION FOR CONVEYANCE.
IN CASE OF ACCIDENT, NOTIFY CODE ADMINISTRATION 703.746.4200

APPENDIX B (continued) - ELEVATOR CERTIFICATES

CITY OF ALEXANDRIA
Department of Code Administration
301 King Street, Room 4200
Alexandria, Virginia 22314

LIFT CERTIFICATE

CASE NUMBER: ELV2018-01875 DATE CERTIFICATE EXPIRES: 03/31/2019
SITE ADDRESS: 4646 SEMINARY RD
OWNER: ALEXANDRIA PUBLIC SCHOOLS

ELEVATOR NO: 3
TYPE OF CONVEYANCE: LIFT
TYPE OF PROPULSION: DRUM
FREIGHT/PASSENGER: PASSENGER
MAXIMUM CAPACITY - WEIGHT: 750 lbs
MAXIMUM CAPACITY - PASSENGERS: 1 (Including Operator)

This is to certify that the conveyance described above has been duly inspected and reported to be in safe condition.

By:__________________
Gregg Fields
Director

THIS CERTIFICATE MUST BE FRAMED AND PLACED IN A CONSPICIOUS LOCATION FOR CONVEYANCE.
IN CASE OF ACCIDENT, NOTIFY CODE ADMINISTRATION 703.746.4200

CITY OF ALEXANDRIA
Department of Code Administration
301 King Street, Room 4200
Alexandria, Virginia 22314

LIFT CERTIFICATE

CASE NUMBER: ELV2018-01903 DATE CERTIFICATE EXPIRES: 03/31/2019
SITE ADDRESS: 4646 SEMINARY RD
OWNER: ALEXANDRIA PUBLIC SCHOOLS

ELEVATOR NO: 4
TYPE OF CONVEYANCE: LIFT
TYPE OF PROPULSION: DRUM
FREIGHT/PASSENGER: PASSENGER
MAXIMUM CAPACITY - WEIGHT: 750 lbs
MAXIMUM CAPACITY - PASSENGERS: 1 (Including Operator)

This is to certify that the conveyance described above has been duly inspected and reported to be in safe condition.

By:__________________
Gregg Fields
Director

THIS CERTIFICATE MUST BE FRAMED AND PLACED IN A CONSPICIOUS LOCATION FOR CONVEYANCE.
IN CASE OF ACCIDENT, NOTIFY CODE ADMINISTRATION 703.746.4200

APPENDIX B (continued) - ELEVATOR CERTIFICATES

CITY OF ALEXANDRIA
Department of Code Administration
301 King Street, Suite 4200
Alexandria, Virginia 22314
Phone: 703.746.4200

ELEVATOR CERTIFICATE

CASE NUMBER: **ELV2018-00168**
DATE CERTIFICATE EXPIRES: **11/30/2018**
SITE ADDRESS: **2601 CAMERON MILLS RD**
OWNER: **CITY OF ALEX./GEORGE MASON ELEM**

ELEVATOR NO: **1**
TYPE OF CONVEYANCE: **ELEVATOR**
TYPE OF PROPULSION: **HYDRAULIC**
FREIGHT/PASSENGER: **PASSENGER**
MAXIMUM CAPACITY - WEIGHT: **3500** lbs
MAXIMUM CAPACITY - PASSENGERS: **23** (Including Operator)

This is to certify that the conveyance described above has been duly inspected and reported to be in safe condition.

By: ____________________
Gregg Fields
Director

THIS CERTIFICATE MUST BE FRAMED AND PLACED IN A CONSPICUOUS LOCATION FOR CONVEYANCE.
IN CASE OF ACCIDENT, NOTIFY DEPARTMENT OF CODE ADMINISTRATION 703.746.4200

CITY OF ALEXANDRIA
Department of Code Administration
301 King Street, Room 4200
Alexandria, Virginia 22314

ELEVATOR CERTIFICATE

CASE NUMBER: **ELV2018-00771**
DATE CERTIFICATE EXPIRES: **03/31/2019**
SITE ADDRESS: **1005 MOUNT VERNON AV**
OWNER: **CITY OF ALEXANDRIA PUBLIC SCHOOLS**

ELEVATOR NO: **1**
TYPE OF CONVEYANCE: **ELEVATOR**
TYPE OF PROPULSION: **HYDRAULIC**
FREIGHT/PASSENGER: **PASSENGER**
MAXIMUM CAPACITY - WEIGHT: **2000** lbs
MAXIMUM CAPACITY - PASSENGERS: **13** (Including Operator)

This is to certify that the conveyance described above has been duly inspected and reported to be in safe condition.

By: ____________________
Gregg Fields
Director

THIS CERTIFICATE MUST BE FRAMED AND PLACED IN A CONSPICIOUS LOCATION FOR CONVEYANCE.
IN CASE OF ACCIDENT, NOTIFY CODE ADMINISTRATION 703.746.4200

APPENDIX B (continued) - ELEVATOR CERTIFICATES

CITY OF ALEXANDRIA
Department of Code Administration
301 King Street, Room 4200
Alexandria, Virginia 22314

ELEVATOR CERTIFICATE

CASE NUMBER: **ELV2018-00772** DATE CERTIFICATE EXPIRES **03/31/2019**
SITE ADDRESS: **1005 MOUNT VERNON AV**
OWNER: **ALEXANDRIA PUBLIC SCHOOLS**

ELEVATOR NO: **2**
TYPE OF CONVEYANCE: **ELEVATOR**
TYPE OF PROPULSION: **HYDRAULIC**
FREIGHT/PASSENGER: **PASSENGER**
MAXIMUM CAPACITY - WEIGHT: **5000** lbs
MAXIMUM CAPACITY - PASSENGERS: **33** (Including Operator)

This is to certify that the conveyance described above has been duly inspected and reported to be in safe condition.

By: ______________________
Gregg Fields
Director

THIS CERTIFICATE MUST BE FRAMED AND PLACED IN A CONSPICIOUS LOCATION FOR CONVEYANCE.
IN CASE OF ACCIDENT, NOTIFY CODE ADMINISTRATION 703.746.4200

CITY OF ALEXANDRIA
Department of Code Administration
301 King Street, Room 4200
Alexandria, Virginia 22314

LIFT CERTIFICATE

CASE NUMBER: **ELV2017-00773** DATE CERTIFICATE EXPIRES: **07/31/2018**
SITE ADDRESS: **1005 MOUNT VERNON AV**
OWNER: **ALEXANDRIA PUBLIC SCHOOLS**

ELEVATOR NO: **3**
TYPE OF CONVEYANCE: **LIFT**
TYPE OF PROPULSION: **HYDRAULIC**
FREIGHT/PASSENGER: **PASSENGER**
MAXIMUM CAPACITY - WEIGHT: **750** lbs
MAXIMUM CAPACITY - PASSENGERS: **1** (Including Operator)

This is to certify that the conveyance described above has been duly inspected and reported to be in safe condition.

By: ______________________
Gregg Fields
Director

THIS CERTIFICATE MUST BE FRAMED AND PLACED IN A CONSPICIOUS LOCATION FOR CONVEYANCE.
IN CASE OF ACCIDENT, NOTIFY CODE ADMINISTRATION 703.746.4200

APPENDIX C – GENERATOR INSPECTION REPORTS

WesMart, Inc

1635-5 Woodside Drive
Woodbridge, VA 22191

(703) 491-1096 E-mail wesmart@aol.com FAX (703) 491-3015

MAINTENANCE INSPECTION FOR GENERATOR SYSTEMS 150401-C Page 1

CUSTOMER	Alexandria City Public Schools	SITE	George Mason Elementary	W/O #	12415	DATE	13 AUG 2015
GENERATOR MFG.	KOHLER 150KW	MODEL #	150REOZJB	SPEC #	GM20148-GA3	SER #	766821
ENGINE MFG.	JOHN DEERE	MODEL #	PE6068 HF150	SPEC #	N/A	SER #	PE6068H276039
ENGINE TYPE #	N/A	ENGINE CPL #	N/A	HRS	0253.8	HRF	0254.3

ENGINE

GASOLINE

N / A	SPARK PLUGS
N / A	IGNITION POINTS
N / A	BELTS
N / A	CHOKE
N / A	DISTRIBUTOR
N / A	IGNITION WIRES
N / A	SERVICE AIR CLEANER
N / A	CHECK ENGINE MOUNTS
N / A	CHECK ABNORMAL SOUNDS
N / A	CHECK VIBRATIONS

DIESEL

✓	BELTS
	SERVICE AIR CLEANER
✓	INJECTION PUMP
✓	TURBO(S)
✓	CHECK ENGINE MOUNTS
✓	CHECK ABNORMAL SOUNDS
✓	CHECK VIBRATIONS
✓	CHECK INJECTOR LINES
N / A	CHECK GLOW PLUGS

STARTING SYSTEM

✓	CHECK STARTER / SOLENOID
	CHECK STARTER SOLENOID

OIL SYSTEM

✓	CHECK ENGINE LUBRICATION
	OIL FILTER
✓	CHECK ENTIRE UNIT FOR LEAKS
	CHECK OIL COOLER
	CHECK OIL PAN
	CHECK OIL LEVEL Full

FUEL SYSTEM

✓	CHECK FLEXIBLE CONNECTION & LINES
N / A	CHECK DAY TANK FLOAT LEVEL
N / A	CHECK FUEL TRANSFER PUMP
	CHECK FUEL FILTER (S)
✓	CHECK FUEL SOLENOID
✓	CHECK ENGINE FUEL PUMP AND PRESSURE
	TYPE OF FUEL DIESEL
✓	FUEL LEVEL Full 12 1/2 "
	FUEL TANK CAPACITY 150 Gallons 15 "

COOLING SYSTEM

✓	CHECK ENGINE RADIATOR COOLANT
	RECORD PROTECTION - 40 DEGREES SCALING 1.2
✓	CHECK ENGINE BLOCK HEATER AND
	RECORD WATER TEMP. 105 DEGREES
N / A	CHECK ENGINE FINS (AIR COOLED)
N / A	CHECK SOLENOID VALVE AND FLEX WATER LINES
N / A	CHECK LOUVER OPERATION
	CHECK FOR LEAKS, HOSE CONDITION, AND TIGHTEN HOSE CLAMPS

EXHAUST SYSTEM

✓	CHECK EXHAUST MOUNTS AND EXHAUST SMOKE
✓	VISUAL INSPECTION FOR LEAKS & (DRAIN TRAP)

SAFETY OPERATING CHECK

✓	LOW OIL PRESSURE		PRE LOW OIL PRESSURE
✓	HIGH ENGINE TEMP.		PRE HIGH ENGINE TEMP.
	OVER SPEED		LOW FUEL
	OVER CRANK		LOW ENGINE TEMP.
	LOW COOLANT LEVEL		LOW FREQ
✓	OUTPUT		LOW BATTERY VOLTAGE

BUILDING LOAD TEST

GENERATOR OUTPUT

AMPS	A L1	B L2	C L3	
H				AMPS
L	27	14	10	AMPS

VOLTAGE	A - B L1 - L2	B - C L2 - L3	A - C L1 - L3	
LOAD ✓				
NO LOAD	210	212	212	VOLTS
ADJUST VOLTAGE REGULATOR				VOLTS

	A - N L1 - N	B - N L2 - N	C - N L3 - N	
VOLTAGE	121	122	123	VOLTS
FREQUENCY	59.8	HZ ADJUSTED TO		HZ

ENGINE WATER TEMP.	170	DEGREES
ENGINE OIL PRESSURE	50 +	PSI
ENGINE OIL TEMP.	N/A	

ELECTRICAL

✓	CHECK ELECTRICAL CONNECTIONS
N / A	CHECK AC/DC BRUSHES
✓	CHECK DC ALTERNATOR

✓	OK
O	POTENTIAL PROBLEM
X	URGENT PROBLEM
1	ADJUST
2	REPAIR OR REPLACE

REMARKS:

APPENDIX C (continued)– GENERATOR INSPECTION REPORTS

WesMart, Inc

1635-5 W...
Woodbrid...

(703) 491-1096 E-mail wesmart@aol.com FAX ...

MAINTAINENCE INSPECTION FOR BATTERY SYSTEMS 150401-C

DATE 13 AUG

CUSTOMER Alexandria City Public Schools SITE George Mason Elementary WO # 12415

BATTERY CHARGER	B1	Float Amps	Load Amps	B2	Float Amps	Load Amps	DC ALTERNATOR	Starting Amps	Final A...
		0.2 -	3.8		X -	X		21 -	2...
BATTERY	B1	Float Voltage		B2	Float Voltage		B1	Volts	
		12.60			X			14.10	
BATTERY	B1	With Load Voltage		B2	With Load Voltage		B2	Volts	
		11.80			X			X	

CHECK BATTERY SYSTEM

✓	BATTERY CHARGER
N / A	CHECK SOLUTION LEVEL
✓	CHECK CONNECTIONS AND CLEAN, IF APPLICABLE
✓	NOTE OVERALL CONDITION OF BATTERY SYSTEM

✓	OK
O	POTENTIAL PROBLEM
X	URGENT PROBLEM
1	ADJUST
2	REPAIR OR REPLACE

RECORD SPECIFIC GRAVITY

							BATTERY NUMBER	DATE C...
B1 CELL 1-6	S	E	A	L	E	D	INT31P-MHD	Jun
B2 CELL 7-12								
B3 CELL 13-18								
B4 CELL 19-24								

REMARKS:

BATTERY INSTALL DATE 13 AUG
BATTERY INSTALL DATE
BATTERY INSTALL DATE
BATTERY INSTALL DATE

APPENDIX C (continued)– GENERATOR INSPECTION REPORTS

WesMart, Inc

1635-5 Woodside Drive
Woodbridge, VA 22191

(703) 491-1095 E-mail wesmart@aol.com FAX (703) 491-3015

MAINTENANCE INSPECTION FOR GENERATOR SYSTEMS 150401-E Page 1

CUSTOMER	Alexandria City Public Schools	SITE	George Washington Middle School	W/O #	12417	DATE	3 Sept 2015
GENERATOR MFG.	KOHLER 135KW	MODEL #	135ROZJ	SPEC #	PA-189721	SER #	600469
ENGINE MFG.	JOHN DEERE	MODEL #	6081ITF001	SPEC #	N/A	SER #	RG6081T056056
ENGINE TYPE #	N/A	ENGINE CPL #	N/A	HRS	0445.1	HRF	0445.3

ENGINE

GASOLINE

N / A	SPARK PLUGS
N / A	IGNITION POINTS
N / A	BELTS
N / A	CHOKE
N / A	DISTRIBUTOR
N / A	IGNITION WIRES
N / A	SERVICE AIR CLEANER
N / A	CHECK ENGINE MOUNTS
N / A	CHECK ABNORMAL SOUNDS
N / A	CHECK VIBRATIONS

DIESEL

✓	BELTS
2	SERVICE AIR CLEANER
✓	INJECTION PUMP
✓	TURBO(S)
✓	CHECK ENGINE MOUNTS
✓	CHECK ABNORMAL SOUNDS
✓	CHECK VIBRATIONS
✓	CHECK INJECTOR LINES
N / A	CHECK GLOW PLUGS

STARTING SYSTEM

✓	CHECK STARTER / SOLENOID
N / A	CHECK STARTER SOLENOID

OIL SYSTEM

✓	CHECK ENGINE LUBRICATION
2	OIL FILTER
✓	CHECK ENTIRE UNIT FOR LEAKS
✓	CHECK OIL COOLER
✓	CHECK OIL PAN
2	CHECK OIL LEVEL Low-Dirty

FUEL SYSTEM

✓	CHECK FLEXIBLE CONNECTION & LINES
✓	CHECK DAY TANK FLOAT LEVEL
✓	CHECK FUEL TRANSFER PUMP
2	CHECK FUEL FILTER (S)
✓	CHECK FUEL SOLENOID
✓	CHECK ENGINE FUEL PUMP AND PRESSURE

TYPE OF FUEL DIESEL

✓ FUEL LEVEL 7/8 33 1/2 "

FUEL TANK CAPACITY 300 Gallons 36 "

COOLING SYSTEM

✓ CHECK ENGINE RADIATOR COOLANT

RECORD PROTECTION - 40 DEGREES

✓ CHECK ENGINE BLOCK HEATER AND

RECORD WATER TEMP. 100 DEGREES

N / A	CHECK ENGINE FINS (AIR COOLED)
N / A	CHECK SOLENOID VALVE AND FLEX WATER LINES
✓	CHECK LOUVER OPERATION
✓	CHECK FOR LEAKS, HOSE CONDITION, AND TIGHTEN HOSE CLAMPS

EXHAUST SYSTEM

✓	CHECK EXHAUST MOUNTS AND EXHAUST SMOKE
✓	VISUAL INSPECTION FOR LEAKS & (DRAIN TRAP)

SAFETY OPERATING CHECK

	LOW OIL PRESSURE		PRE LOW OIL PRESSURE
	HIGH ENGINE TEMP.		PRE HIGH ENGINE TEMP.
	OVER SPEED		LOW FUEL
	OVER CRANK		LOW ENGINE TEMP.
	LOW COOLANT LEVEL	N / A	LOW FREQ
	OUTPUT		LOW BATTERY VOLTAGE

BUILDING LOAD TEST

GENERATOR OUTPUT

AMPS	A L1	B L2	C L3	
H				AMPS
L				AMPS

VOLTAGE	A - B L1 - L2	B - C L2 - L3	A - C L1 - L3	
LOAD				
NO LOAD ✓	480	480	480	VOLTS

ADJUST VOLTAGE REGULATOR VOLTS

SCALING 1.2

VOLTAGE	A - N L1 - N	B - N L2 - N	C - N L3 - N	
	277	277	277	VOLTS

FREQUENCY 60.1 HZ ADJUSTED TO HZ

ENGINE WATER TEMP.	170	DEGREES
ENGINE OIL PRESSURE	50+	PSI
ENGINE OIL TEMP.	NO GAUGES	

ELECTRICAL

✓	CHECK ELECTRICAL CONNECTIONS
	CHECK AC/DC BRUSHES
✓	CHECK DC ALTERNATOR

✓	OK
O	POTENTIAL PROBLEM
X	URGENT PROBLEM
1	ADJUST
2	REPAIR OR REPLACE

REMARKS:

WesMart, Inc

1635-5 Woodside Drive
Woodbridge, VA 22191
(703) 491-1096
E-mail wesmart@aol.com
FAX (703) 491-3015

MAINTAINENCE INSPECTION FOR BATTERY SYSTEMS 150401-E

Page 2

DATE 3 Sept 2015

CUSTOMER Alexandria City Public Schools SITE George Washington Middle School WO # 12417

BATTERY CHARGER	B1 Float Amps - Load Amps	0.4 - 1.8	B2 Float Amps - Load Amps	N/A - N/A	DC ALTERNATOR Starting Amps - Final Amps	48 - 4.2
BATTERY	B1 Float Voltage	12.80	B2 Float Voltage	N/A	B1 Volts	14.50
BATTERY	B1 With Load Voltage	11.50	B2 With Load Voltage	N/A	B2 Volts	N/A

CHECK BATTERY SYSTEM

✓	BATTERY CHARGER
✓	CHECK SOLUTION LEVEL
✓	CHECK CONNECTIONS AND CLEAN, IF APPLICABLE
✓	NOTE OVERALL CONDITION OF BATTERY SYSTEM

✓	OK
O	POTENTIAL PROBLEM
X	URGENT PROBLEM
1	ADJUST
2	REPAIR OR REPLACE

RECORD SPECIFIC GRAVITY

							BATTERY NUMBER	DATE CODE
B1 CELL 1-6	S	E	A	L	E	D	INT31P-MHD	AUG H4
B2 CELL 7-12								
B3 CELL 13-18								
B4 CELL 19-24		=========	=========	=========	=========	========>		

REMARKS:

BATTERY INSTALL DATE MAY 2004
BATTERY INSTALL DATE
BATTERY INSTALL DATE
BATTERY INSTALL DATE

WesMart, Inc
1635-5 Woodside Drive
Woodbridge, VA 22191
(703) 491-1096 E-mail wesmart@aol.com FAX (703) 491-3015

MAINTAINENCE INSPECTION FOR TRANSFER SWITCHES 150401-E

Page 3A

DATE 3 Sept 2015

CUSTOMER	Alexandria City Public Schools	SITE	George Washington Middle School	WO #	12417
T/S # 1 MFG	ASCO SERIES 300	MODEL #	A300326091C	SPEC #	
T/S SER #	194668	HRS	NONE	HRF	NONE

✓	INSPECT INSTRUMENTS & GAUGES	✓	START & STOP GENSET FROM SWITCH
	CHECK EXERCISE CLOCK - DST		CALIBRATE VOLTAGE SENSORS
	BATTERY INSTALL DATE		CHECK TIME DELAYS
	CHECK SELECTOR SWITCH		

T/S # 2 MFG	KOHLER	MODEL #	KCT-AMTA-01045	SPEC #	
T/S SER #	K074366	HRS		HRF	

✓	INSPECT INSTRUMENTS & GAUGES	✓	START & STOP GENSET FROM SWITCH
✓	CHECK EXERCISE CLOCK - DST		CALIBRATE VOLTAGE SENSORS
✓	CHECK SELECTOR SWITCH		CHECK TIME DELAYS

T/S # 3 MFG		MODEL #		SPEC #	
T/S SER #		HRS		HRF	

	INSPECT INSTRUMENTS & GAUGES		START & STOP GENSET FROM SWITCH
	CHECK EXERCISE CLOCK - DST		CALIBRATE VOLTAGE SENSORS
	CHECK SELECTOR SWITCH		CHECK TIME DELAYS

T/S # 4 MFG		MODEL #		SPEC #	
T/S SER #		HRS		HRF	

	INSPECT INSTRUMENTS & GAUGES		START & STOP GENSET FROM SWITCH
	CHECK EXERCISE CLOCK - DST		CALIBRATE VOLTAGE SENSORS
	CHECK SELECTOR SWITCH		CHECK TIME DELAYS

✓	OK	1	ADJUST
O	POTENTIAL PROBLEM	2	REPAIR OR REPLACE
X	URGENT PROBLEM		

REMARKS

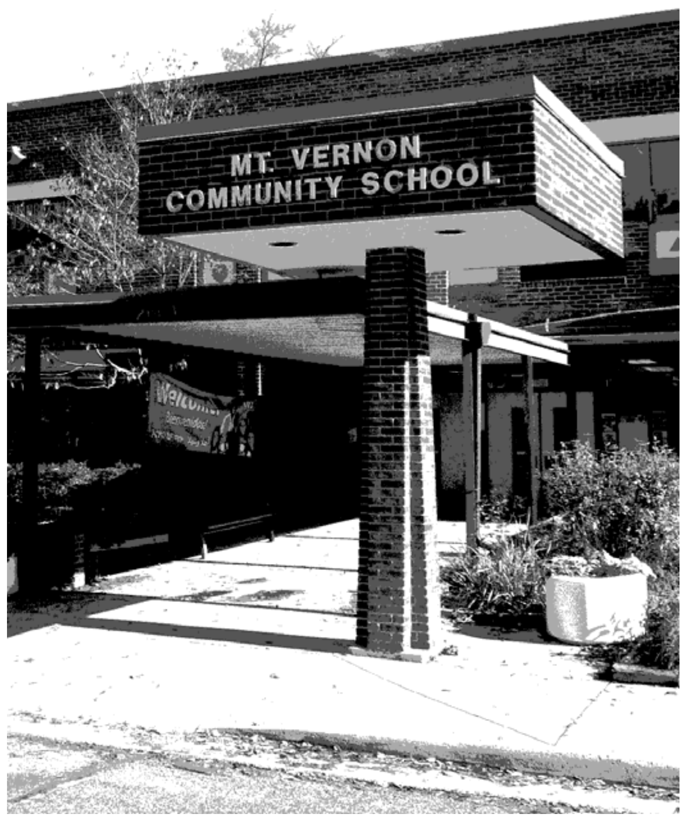
APPENDIX D– MOUNT VERNON COMMUNITY SCHOOL WATER INTRUSION ASSESSMENT REPORT

Mt. Vernon Community School

2601 Commonwealth Ave, Alexandria, VA 22305

Water Intrusion Assessment

Alexandria City Public Schools
Planning, Design & Construction Office
1340 Braddock Place
Alexandria, VA 22314



1 March 2019 - Final Version

Cole&Denny Architects

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1 March 2019 – Final Version

Water Intrusion Assessment
Mt. Vernon Community School
2601 Commonwealth Ave, Alexandria, VA 22305
for
Alexandria City Public Schools
Educational Facilities Department

1 – EXECUTIVE SUMMARY

Project Description

Mount Vernon Community School is a two and three story, 112,730 square foot masonry building. There is a census of 866 students in grades K-5; the school operates with a dual language learning program.

The existing three-story portion was built in 1940, with the auditorium addition in 1949. In 1966, a major addition doubled the size of the school and reoriented the main entrance to Commonwealth Avenue. A media center was added in 1991 and the City expanded and constructed the Mount Vernon Recreation Center adjacent to the school in 1997.

The building's envelope consists of 26 roofs with 58,600 square feet covered with single-ply membrane roofing that is 25 to 32 years old. It has greatly exceeded its effective life. Storm water drainage from the roofs is accomplished with drains feeding internal rain leaders and scuppers or gutters feeding exterior aluminum downspouts that either discharge at grade or into below-grade drain pipe system. Replacement of the entire roofing membranes, insulation and edge metal is scheduled to begin in December 2018.

The exterior walls are brick-faced solid masonry construction with plaster or exposed block interior finishes. Windows are double-paned insulated glass in painted aluminum frames. The original windows in the earlier parts of the building have been replaced with shorter units in order to reduce ceiling heights in the classrooms. A panel of synthetic stucco over polystyrene insulation was added above the replacement windows to fill the space remaining in the original masonry openings. None of the exterior walls appear to include a vapor barrier and, in addition, are penetrated at every classroom by large aluminum louvers serving the unit-ventilators in those rooms.

Recent interior conditions thought to be resulting from water intrusion have created environmental issues requiring constant attention and inhibiting the proper function of the school. Propagation of mold and other hygiene issues have raised concern in both the administration and the school community. In response, the ACPS Educational Facilities Department commissioned a team of architectural, engineering and environmental specialists to assess the water intrusion conditions and develop preliminary recommendations for remediation.

Approach

The assessment team of Cole & Denny Architects, provided project management and architectural assessment; Potomac Energy Group, provided assessment of the HVAC systems; and Applied Environmental, provided assessment of observable mold and other environmental hygiene conditions. Their efforts concentrated on moisture related issues related to the building's

- roof
- exterior walls and windows, and
- HVAC system.

Between 29 October and 14 November 2018, the team conducted nine surveys to observe and record water-related deficiencies throughout the building. Additionally, they reviewed the limited plans and other documents available from ACPS in order to better understand the building's underlying construction. ACPS facilities staff provided valuable support and information regarding building operations and the maintenance and repair history related to water intrusion.

The architectural team also conducted a Peer Review of the roofing replacement design documents prepared by Restoration Engineering Incorporated, dated 5/2/2018.

Findings

The surveys disclosed a number of elements that are contributing to the unsatisfactory conditions currently affecting the building. To summarize, the water intrusion and mold growth result from:

- high relative humidity,
- roof leaks from failed membrane and numerous penetrations,
- insufficient roof drainage capacity,
- condensation on dual temperature HVAC piping,
- leaks in sanitary piping,
- lack of vapor barrier at the exterior walls,
- inadequate maintenance, and
- incorrect HVAC system controls settings.

Recommendations

Broadly speaking, it is recommended that the school be repaired to eliminate water entry, which includes

- Replacing the roof,
- Correcting storm water management issues and increasing roof drainage capacity,
- Renovating the exterior wall – particularly on the older, eastern sections of the facility – to add a vapor barrier (and insulation, if feasible),
- Replacing the two-pipe mechanical system with a VRF system, and
- Removing materials that have mold-growth or are water damaged and, thus, likely to promote mold growth in the future.

Remediation Approach

The heightened concern about the effects of water intrusion on the interior environment suggests that the deficiencies be corrected as soon as possible. Fortunately this imperative coincides with the roofing replacement project beginning in 2018 and the planned closing of the building during the summer of 2019, providing the opportunity to address the recommendations, in large part, before the 2019-2020 school year starts.

Rather than making the repairs in a series of small steps over the coming months, a more efficient and effective approach would be to take advantage of the summer recess to complete the recommended work. Replacing the HVAC system may be achievable in the same timeframe but, depending on the system that is chosen, that work is likely to require a longer schedule to complete.

In any case, moving ahead with dispatch will require the Educational Facilities Department to secure the services of architects and engineers at once in order to have the building permit and the services of a general contractor secured in time to begin work in late June 2019 when the current school year ends.

Cost [not yet determined]

2 – FINDINGS[1]

ARCHITECTURAL

Roofing

The majority of the current roofing system is a Hypalon membrane over rigid insulation. It was originally installed over 30 years ago and has been repaired in a number of areas. It is degraded and has exceeded its service life. The roof membrane and deck beneath have many penetrations that are active sources of water entry into the building.

There are many pieces of equipment on the roofs which appear to have no current purpose. They are poorly secured or maintained and many have curbs which do not comply with best practices. Each piece of abandoned equipment presents an opportunity for failure of the roofing system.

Much of the drainage from the roofs is primarily achieved through small scuppers which feed aluminum downspouts, which do not appear to be sized to accommodate the runoff. In most instances, the runoff from the upper roofs is discharged onto lower roofs with similarly undersized downspouts and, ultimately, discharged at grade near the walls of the building.

Replacement of the roofing system will be constructed in two phases and is currently scheduled to begin in December 2018 and finish in August 2019.

As a part of this assessment, CDA conducted a Peer Review[2] of the bid documents. The design-related results of the Peer Review are summarized as follows:

- the roofing system should be replaced as soon as possible;
- implementation should occur in coordination with other improvements recommended in this report;
- reduce reliance on scuppers - add roof drains with internal rain leaders; and
- tie outfall points into an underground storm sewer system.

The review also pointed out a number of drafting coordination issues which are not germane to this report, but noted in the Peer Review in the Appendix.

[1] See Appendix for survey diagrams, full mechanical report and full industrial hygiene report

[2] See Appendix for the Peer Review report.

Exterior Walls

The construction of the exterior walls of the building appear[3] to be solid masonry consisting of a brick outer wythe and concrete block inner wythe. The collar joints are solidly grouted. The finish on the inner face of the walls are attached directly to the concrete block and are either plaster on metal lathe or, in more recently constructed additions, drywall panels on furring channels. In either case the exterior walls do not have a vapor barrier. In general, the condition of the walls is good; cracking was limited to two small areas and can be attributed to lack of control joints in those areas. New control joints should be added in those areas.

Earlier renovations to the mechanical system, which added two-pipe unit ventilators to the building, introduced large fresh air louvers in the walls at each classroom. These louvers are approximately 11 inches tall and 80 inches long. In addition, a renovation to lower the classroom ceilings in the earliest parts of the building and replace the original windows with aluminum, insulated-glass windows resulted in installation of EIFS (Exterior Insulation and Finish System) panels above the windows. These decorative panels are approximately 34 inches tall and 11 feet long. The construction of the panels is not insulated and does not have a vapor barrier.

Windows

The windows in the building are 1 inch thick insulating glass panels set in factory painted aluminum frames. It is not apparent whether the frames are thermally broken. The window units appear to be in good condition and, over the past two years, 22 sections have been renovated to install head flashing and receivers with end dams and weep holes in order to improve leak resistance. This work is on-going and implemented as conditions require.

Visual survey showed that perimeter sealants are deteriorating and should be replaced in the next two years.

[3] Complete construction documents of the original building and additions do not exist and destructive investigation was not conducted. Conclusions regarding building elements is based on limited documentation, input from building staff and field observation by professional architects and engineers.

Stormwater Drainage

Storm water from the roofs is largely discharged by means of surface-mounted downspouts which have open joints and appear to be clogged. This has resulted in slowed roof drainage and uncontrolled overflow during rain storms.

More significantly, the drainage design compounds water loads on roofs and outfalls at grade, creating backflow in the downspouts, increasing leaks at roofs and associated walls and creating safety hazards at grade. In a number of conditions, downspouts that have become disconnected from the boots serving the underground storm sewer have not been reconnected, causing damage to surrounding areas and surcharging the groundwater table.

Additionally, overflow from the downspouts in a few areas have eroded the brick joints in the adjacent walls and surcharge the walls with water which has migrated into the building requiring significant repair and restoration.

MECHANICAL

Equipment

The school HVAC system consists of several different systems with various service lives. A chiller and three (3) boilers provide cooling and heating for almost all of the classrooms through unit ventilators (UV), and to the cafeteria through two air handling units (AHU).

Each classroom has one unit ventilator (UV).

Corridors and administration offices are also conditioned by chiller and boilers through fan coil units (FCU).

The auditorium is conditioned by two gas heat rooftop units (RTUs) which are in very poor condition. Water penetration into the supply air chamber of the units was observed during this investigation.

The Media Center is conditioned by four (4) direct expansion air conditioning (DX) systems with hot water heating coils.

Most of the HVAC systems provide fresh air to occupied spaces. Some systems provide excessive outside air. The outside air quantities are controlled by motorized dampers.

Some of the roof mounted equipment opens to the outside without any dampers.

Many relief air dampers are installed backward and allow untreated air to infiltrate inside the building.

Humidity

The building has excessive levels of relative humidity (RH). The extent of high RH is noticeable almost throughout the building. None of the existing systems have dehumidification capabilities. The systems cannot be forced to lower the RH level inside the occupied spaces without overcooling the spaces.

Signs of condensation and tracks of water drops have been noticed above the ceiling on pipe insulation, bottom of roof decks, and on steel structures. The cause may be equally shared by poor building envelope design and poor HVAC operation.

Ventilation

With exception of the library units and a small RTU for the music room, the remaining HVAC systems are about 20 years old and at the end of their average service life. The systems do not have proper control on ventilation air quantities. Regardless of fully occupied or unoccupied spaces, the systems deliver the same amount of fresh air into the space. This is severe in the case of unit ventilators in the classrooms. The unit ventilators' fresh air quantity approaches over 600 CFM in most cases while its capacity is half of that.

Air Pressure

Parts of the building are under negative pressure because the kitchen does not have a makeup air unit to off-set the exhausted air removed from the space by the hood exhaust fan. Negative pressure draws humid air from the outside into the building.

All of the above conditions, in addition to a poor building envelope have contributed to excessive levels of high RH.

INDUSTRIAL HYGIENE

The entire school building was inspected for mold growth. 21 spaces showed water damage or suspected mold growth and, of those, 17 were found to have suspected mold growth.

A detailed listing of the findings and recommendation for remediation is provided on pages 3 – 9 of Applied Environmental's report[4].

Additionally, the areas likely to be disturbed by remediation were visually inspected and 51 samples taken to be tested for the presence of asbestos-containing materials (ACM). The results of the tests are not currently available, but school facilities staff reports that ACM has been confirmed at joint mastics for the insulation on dual temperature water piping.

[4] See Appendix.

3 – RECOMMENDATIONS

Architectural

The following recommendations address envelope deficiencies and should be implemented along with the Mechanical and Industrial Hygiene recommendations outlined below.

1. Replace roofing membrane, insulation, drains, copings and flashings immediately. [*This recommendation is currently being addressed by ACPS with the first phase of replacement scheduled to begin in December 2018.*]
2. Add roof drains and interior rain leaders instead of relying on scuppers and downspouts.
3. Remove rooftop equipment that is no longer functional and properly seal associated penetrations.
4. Renovate the interior side of the exterior walls to add a vapor barrier and insulation where feasible.
5. Add head and sill flashing with weep drains and end dams at all window openings.
6. Remove mold, including where found above both newer and original ceilings, and replace saturated substrates.
7. Clean out all downspouts - securely connect to below grade system boots.
8. Video the below grade drainage system - confirm it is connected to a city storm sewer and remove any obstructions.
9. Repair and point up masonry walls where eroded at downspouts.
10. Replace aged sealants at masonry walls and windows with sealant.
11. Reattach insulation to underside of Media Center roof.
12. Replace insulation on chilled water piping.
13. Test flaking paint in the ceiling plenums and, if positive for lead, remove.
14. Remove earth and planting beds against the exterior walls.
15. Regrade low or back-sloped areas to provide positive drainage away from the building.
16. Replace plaster soffits on the west side of the building.

Disregard #12 if the existing two-pipe mechanical system is replaced.

Mechanical

1. Replace the existing two-pipe mechanical system throughout the building, to include:

a. Install variable refrigerant flow (VRF) systems for all classrooms, admin, offices and other small rooms.

b. Install a ducted dedicated outside air system (DOAS) to provide ventilation air for all spaces served by VRF systems.

c. Install rooftop units (RTU) for all large spaces such as Cafeteria, Auditorium, Library, and Gym.

If replacing the entire system is not feasible, then:

2. Add CO2 sensor in every classroom to control outside air damper.
3. Replace the auditorium RTUs with single zone VAV units. Add CO2 sensor to control outside air dampers.
4. Add makeup air unit for the kitchen exhaust.
5. Replace cafeteria's AHUs.
6. Provide fresh air for music room.
7. Insulate refrigerant lines of AHUs in the library.
8. Add float switch to all AHUs drip pans.
9. Remove and re-install relief air dampers properly.
10. Remove abandoned RUVs and cap any roof openings below.
11. Repair/replace pipe insulations.
12. Reprogram the building automation system (BAS) to operate cooling systems for dehumidification purpose without opening outside air dampers during unoccupied periods.

Industrial Hygiene

Please refer to the matrix provided on pages 3-9 of the Industrial Hygienist's report for room-by-room recommendations for mold remediation. In conjunction with those specific recommendations, general recommendations for treating water damaged areas are as follows:

1. Remediation activities should be performed according to the guidance provided by the EPA document "Mold Remediation in Schools and Commercial Buildings" (EPA 402-K-01-001). A qualified microbial abatement contractor, using trained mold remediation employees, should conduct all remediation work.

2. Before any successful remediation can be performed, sources of water intrusion or elevated moisture conditions must be identified and eliminated.
3. All remediation activities should be conducted after school hours and after the areas have been vacated by students and staff.
4. Trained individuals wearing proper personal protective equipment (PPE) should perform remediation work. Personal protective equipment should include, at minimum, protective gloves, safety glasses, and an N95 half-face respirator (dust mask). Disposable coveralls are also recommended.
5. Removal areas exhibiting more than ten square feet of active microbial growth should be isolated in a negative pressure enclosure to prevent contamination of adjacent areas. High efficiency particulate air (HEPA) filtration of exhausted air should be performed. Any supply air diffusers or return air grilles within the isolated area should be sealed. For smaller removal areas not necessitating a negative pressure enclosure, a polyethylene drop cloth should be used beneath the removal area, at minimum.
6. Drywall exhibiting visible microbial growth or water damage, such as swelling, buckling, disfigurement, or severe water marking should be removed. All water-damaged materials are susceptible to future microbial contamination. When damaged materials are removed, a minimum of one foot of unaffected material on all sides should be removed as a safety factor.
7. If affected wall materials are removed, underlying insulation should be removed for cleaning and inspection of the wall cavity. Insulation found adjacent to water damaged materials or materials exhibiting microbial growth should be discarded.
8. Interior wall spaces, metal or wooden studs, exterior walls, and adjacent materials should be thoroughly pre-cleaned with a HEPA vacuum. Non-porous surfaces should be wet wiped and sanitized with an appropriate fungicide or other disinfectant sporicidal solution. Aggressive agitation with a stiff brush may be necessary. Once cleaning is complete, the wall cavity and all adjacent materials should be dried thoroughly and re-cleaned with a HEPA vacuum.
9. Mold contaminated materials should be promptly sealed in disposal bags before removal from a negative pressure enclosure or unenclosed work area to prevent contamination of adjacent areas.
10. All areas of mold remediation should be thoroughly dried before reconstruction. Aggressive drying using mechanical air movement and dehumidification can speed drying and is desired once all mold contamination is removed.

Accelerated drying is generally preferable to natural drying to prevent reoccurring mold growth on wet materials.

11. Where feasible, materials that exhibited microbial growth or water damage and were cleaned should be treated with a mildew resistant coating.
12. When carpeting becomes wet, aggressive drying should be initiated immediately. If possible, carpeting should be detached from the sub-floor to promote drying of the underside of the material and the floor below. If padding is installed, it should be discarded. Carpeting that has remained wet for more than 48 hours, or that is flooded repeatedly, should be discarded.

4 – APPENDIX

Supporting documents:

- Water Intrusion Survey dated 15 November 2018 - Cole & Denny Architects
- Roofing Replacement Peer Review dated 15 November 2018 – Cole & Denny Architects
- Evaluation of Existing HVAC System (Draft) dated 14 November 2018 – Potomac Energy Group
- Environmental Report dated 15 November 2018 – Applied Environmental, Inc.
- Limited ACM Sampling Report dated 14 February 2019 – Applied Environmental, Inc.

WATER DAMAGE KEY NOTES HVAC SYSTEM SOURCE (#)

H-1	INSULATION DETERIORATED OR NOT PRESENT ON DUAL TEMPERATURE PIPING - CONDENSATION FORMING, DRIPPING, AND STAINING CEILING PANELS
H-2	INSULATION NOT PRESENT ON REFRIGERATE PIPING - CONDENSATION FORMING, DRIPPING, AND STAINING CEILING PANELS
H-3	INSULATION NOT PRESENT ON DOMESTIC WATER PIPING
H-4	INSULATION DETERIORATED OR NOT PRESENT ON CONDENSATE PIPING
H-5	CONDENSATE PAN MISSING
H-6	STANDING WATER IN CONDENSATE PAN, DRIPPING, AND STAINING CEILING PANELS, FLOOR TILES, CARPET, AND WALL
H-7	CONDENSATE PIPING DRAINS TO POTENTIALLY BLOCKED RAIN LEADER - STAINED CEILING PANELS
H-8	TOILET SANITARY PIPING LEAKING AND STAINING CEILING PANELS
H-9	DIRTY CEILING MOUNTED SUPPLY / RETURN AIR GRILLE
H-10	UNIT VENTILATOR CONDENSATE TRAP ABOVE DRIPPING AND STAINING CEILING PANELS
H-11	ABOVE CEILING FLEXIBLE DUCT NOT CONNECTED TO METAL DUCTWORK
H-12	TRANSFER DUCT INTERSECTS DUAL TEMPERATURE PIPING - INSULATION DETERIORATED, CONDENSATION FORMING, DRIPPING, AND STAINING CEILING PANELS
H-13	STAINED CEILING PANEL - SOURCE NOT IDENTIFIED
H-14	UNIT VENTILATOR NOT FUNCTIONING

WATER DAMAGE KEY NOTES EXTERIOR WALL SOURCE (#)

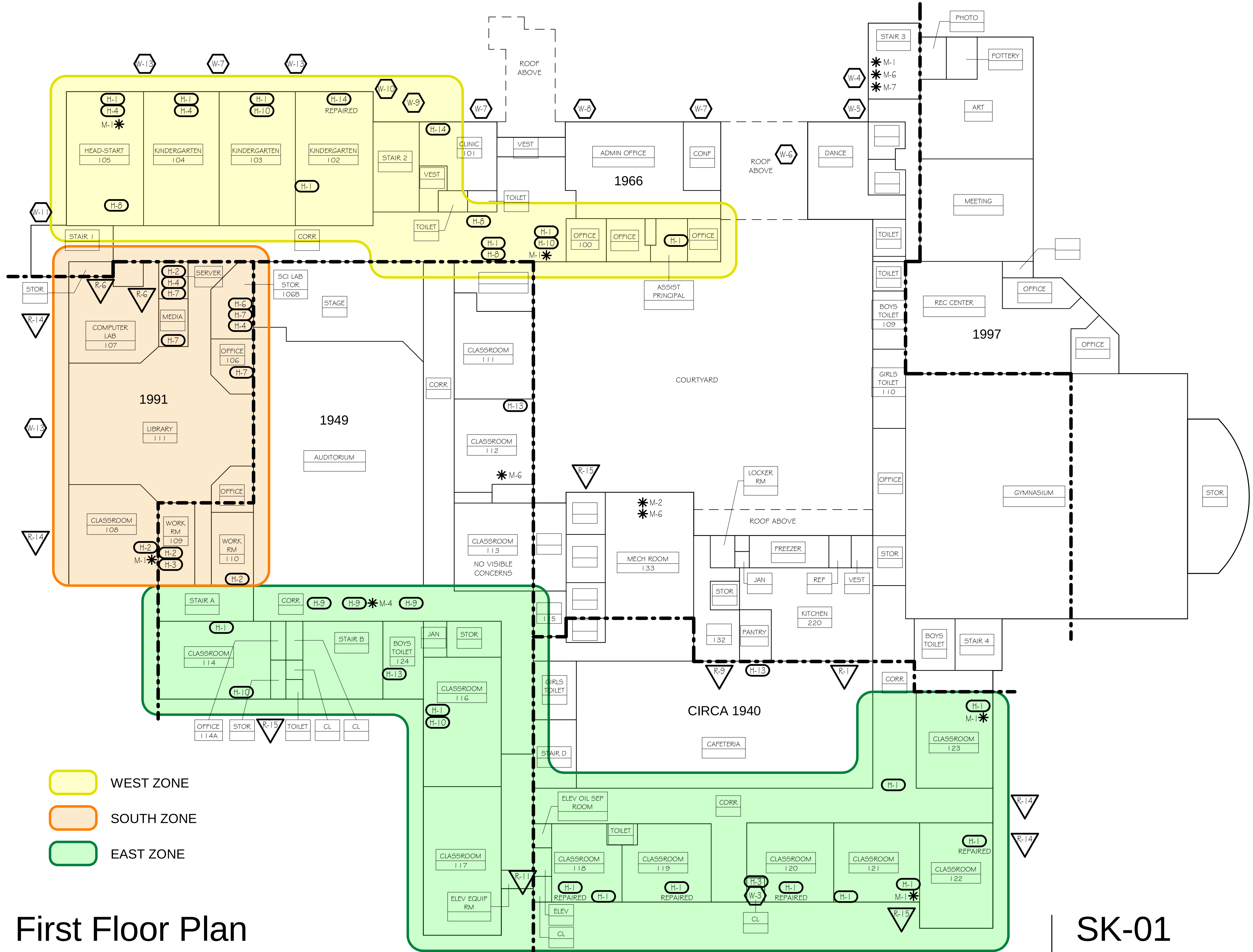
W-1	DETERIORATED CAST STONE SILL
W-2	SUSPECTED LEAK AT WINDOW HEAD FLASHING
W-3	WALL PLASTER BLOOM FROM THRU-WALL WATER INFILTRATION
W-4	SEALANT MISSING AT LOUVER
W-5	DETERIORATING CORNER SEALANT
W-6	SOFFIT CEILING MISSING - PLENUM OPEN AND EXPOSED
W-7	THRU-WALL LOUVER LOW AT GRADE LEVEL
W-8	DETERIORATED SEALANT AT WINDOWS
W-9	SOFFIT EDGE DELAMINATING, OPEN, AND EXPOSED
W-10	MASONRY CONTROL CRACK
W-11	THRESHOLD OPEN BELOW DOOR
W-12	OPEN MASONRY JOINT
W-13	SIDEWALK DRAIN COVERED WITH DIRT

WATER DAMAGE KEY NOTES ROOF SOURCE (#)

R-1	STANDING WATER AND LEAK IN DETERIORATED ROOFING MEMBRANE
R-2	ROOFTOP EXHAUST FAN DOME MISSING - DUCT OPEN TO RAIN
R-3	ABANDONED ROOFTOP EXHAUST FAN DECK LOUVER LEAK
R-4	THRU-DECK METAL FASTENER LEAK
R-5	METAL ROOF DECK PATCH OF GYPSUM ROOF DECK LEAK
R-6	SUSPECTED LEAK AT MASONRY WALL FLASHING OF HIGH SLOPED METAL ROOF
R-7	GYPSUM ROOF DECK HOLE
R-8	ABOVE CEILING RAIN LEADER COUPLER AND THRU-WALL PENETRATION LEAK
R-9	WALL PLASTER BLOOM - SOURCE NOT IDENTIFIED
R-10	STAINED CEILING PANEL - SOURCE NOT IDENTIFIED
R-11	ROOF DRAIN LEAK
R-12	STAINED WALL - SOURCE NOT IDENTIFIED
R-13	SUSPECTED ROOF LEAK AT PARAPET OR SCUPPER
R-14	DOWNSPOUT DISCONNECTED FROM UNDERGROUND STORM LINE
R-15	POOR STORM WATER MANAGEMENT - STORMWATER DISCHARGE AT FOUNDATION

WATER DAMAGE KEY NOTES MOLD OBSERVED *

M-1	MOLD ON CEILING PANEL
M-2	MOLD ON PIPE INSULATION
M-3	MOLD ON GYPSUM BOARD
M-4	MOLD ON CEILING MOUNTED SUPPLY / RETURN AIR GRILLE
M-5	MOLD ON CARPET
M-6	MOLD ON WALL
M-7	MOLD BENEATH VCT



WEST ZONE

SOUTH ZONE

EAST ZONE

Cole&DennyArchitects

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Alexandria, VA 22314

703.684.5994
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First Floor Plan

Mt Vernon Community School - Water Intrusion Assessment
Water Intrusion Survey

2601 Commonwealth Ave
Alexandria, VA 22301

SCALE: 1/32" = 1'-0"

0' 20' 40' 60'

SK-01

13002.11

DATE: 11/15/18

WATER DAMAGE KEY NOTES HVAC SYSTEM SOURCE

H-1	INSULATION DETERIORATED OR NOT PRESENT ON DUAL TEMPERATURE PIPING - CONDENSATION FORMING, DRIPPING, AND STAINING CEILING PANELS
H-2	INSULATION NOT PRESENT ON REFRIGERATE PIPING - CONDENSATION FORMING, DRIPPING, AND STAINING CEILING PANELS
H-3	INSULATION NOT PRESENT ON DOMESTIC WATER PIPING
H-4	INSULATION DETERIORATED OR NOT PRESENT ON CONDENSATE PIPING
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H-8	TOILET SANITARY PIPING LEAKING AND STAINING CEILING PANELS
H-9	DIRTY CEILING MOUNTED SUPPLY / RETURN AIR GRILLE
H-10	UNIT VENTILATOR CONDENSATE TRAP ABOVE DRIPPING AND STAINING CEILING PANELS
H-11	ABOVE CEILING FLEXIBLE DUCT NOT CONNECTED TO METAL DUCTWORK
H-12	TRANSFER DUCT INTERSECTS DUAL TEMPERATURE PIPING - INSULATION DETERIORATED, CONDENSATION FORMING, DRIPPING, AND STAINING CEILING PANELS
H-13	STAINED CEILING PANEL - SOURCE NOT IDENTIFIED
H-14	UNIT VENTILATOR NOT FUNCTIONING

WATER DAMAGE KEY NOTES EXTERIOR WALL SOURCE

W-1	DETERIORATED CAST STONE SILL
W-2	SUSPECTED LEAK AT WINDOW HEAD FLASHING
W-3	WALL PLASTER BLOOM FROM THRU-WALL WATER INFILTRATION
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W-6	SOFFIT CEILING MISSING - PLENUM OPEN AND EXPOSED
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W-8	DETERIORATED SEALANT AT WINDOWS
W-9	SOFFIT EDGE DELAMINATING, OPEN, AND EXPOSED
W-10	MASONRY CONTROL CRACK
W-11	THRESHOLD OPEN BELOW DOOR
W-12	OPEN MASONRY JOINT
W-13	SIDEWALK DRAIN COVERED WITH DIRT

WATER DAMAGE KEY NOTES ROOF SOURCE

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R-7	GYPSUM ROOF DECK HOLE
R-8	ABOVE CEILING RAIN LEADER COUPLER AND THRU-WALL PENETRATION LEAK
R-9	WALL PLASTER BLOOM - SOURCE NOT IDENTIFIED
R-10	STAINED CEILING PANEL - SOURCE NOT IDENTIFIED
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R-14	DOWNSPOUT DISCONNECTED FROM UNDERGROUND STORM LINE
R-15	POOR STORM WATER MANAGEMENT - STORMWATER DISCHARGE AT FOUNDATION

WATER DAMAGE KEY NOTES MOLD OBSERVED

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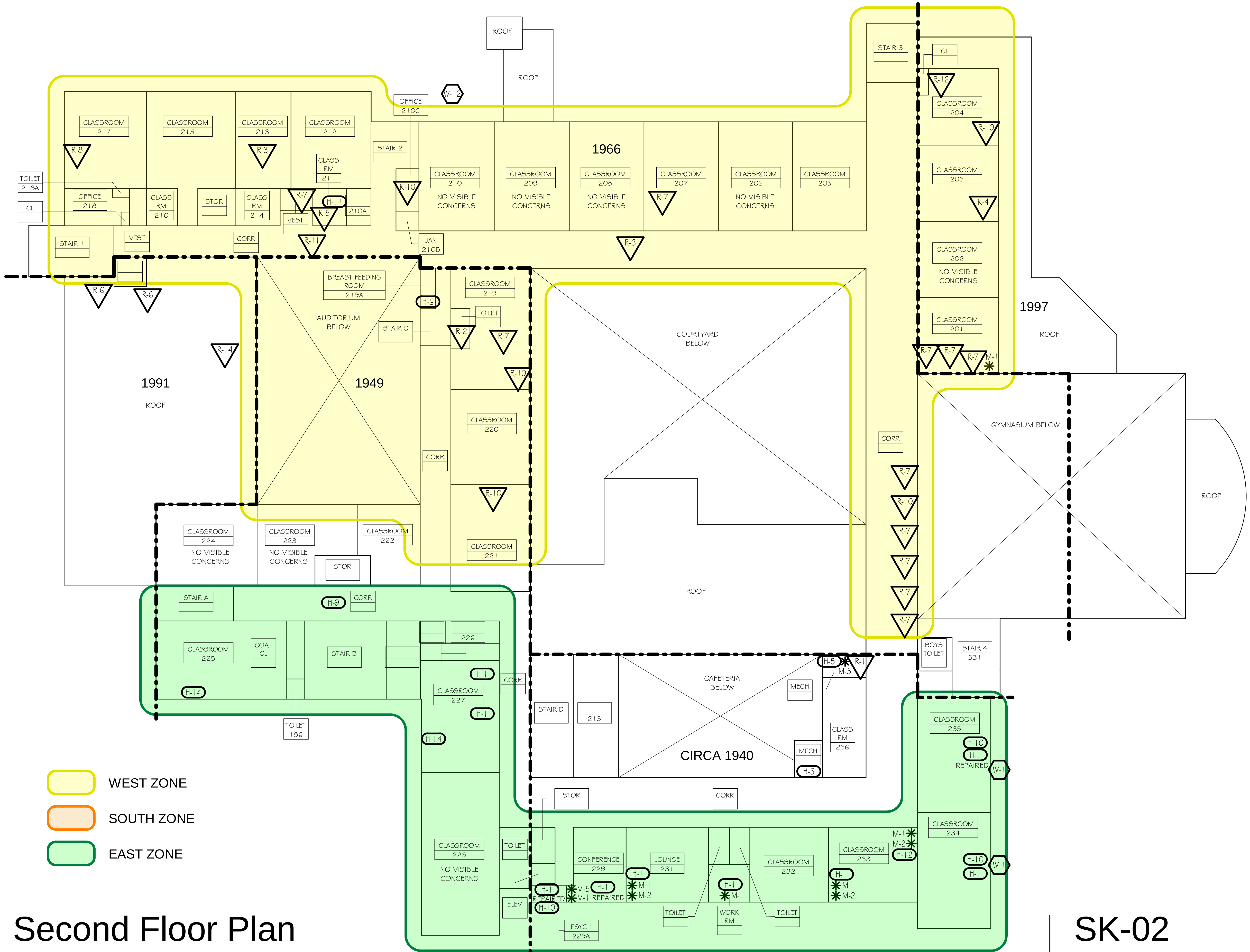
M-2	MOLD ON PIPE INSULATION
M-3	MOLD ON GYPSUM BOARD
M-4	MOLD ON CEILING MOUNTED SUPPLY / RETURN AIR GRILLE
M-5	MOLD ON CARPET
M-6	MOLD ON WALL
M-7	MOLD BENEATH VCT



WEST ZONE
SOUTH ZONE
EAST ZONE

SCALE: 1/32" = 1'-0"
0' 20' 40' 60'

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Second Floor Plan

Mt Vernon Community School - Water Intrusion Assessment
Water Intrusion Survey

2601 Commonwealth Ave
Alexandria, VA 22301

SK-02

13002.11

DATE: 11/15/18

WATER DAMAGE KEY NOTES HVAC SYSTEM SOURCE

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H-8	TOILET SANITARY PIPING LEAKING AND STAINING CEILING PANELS
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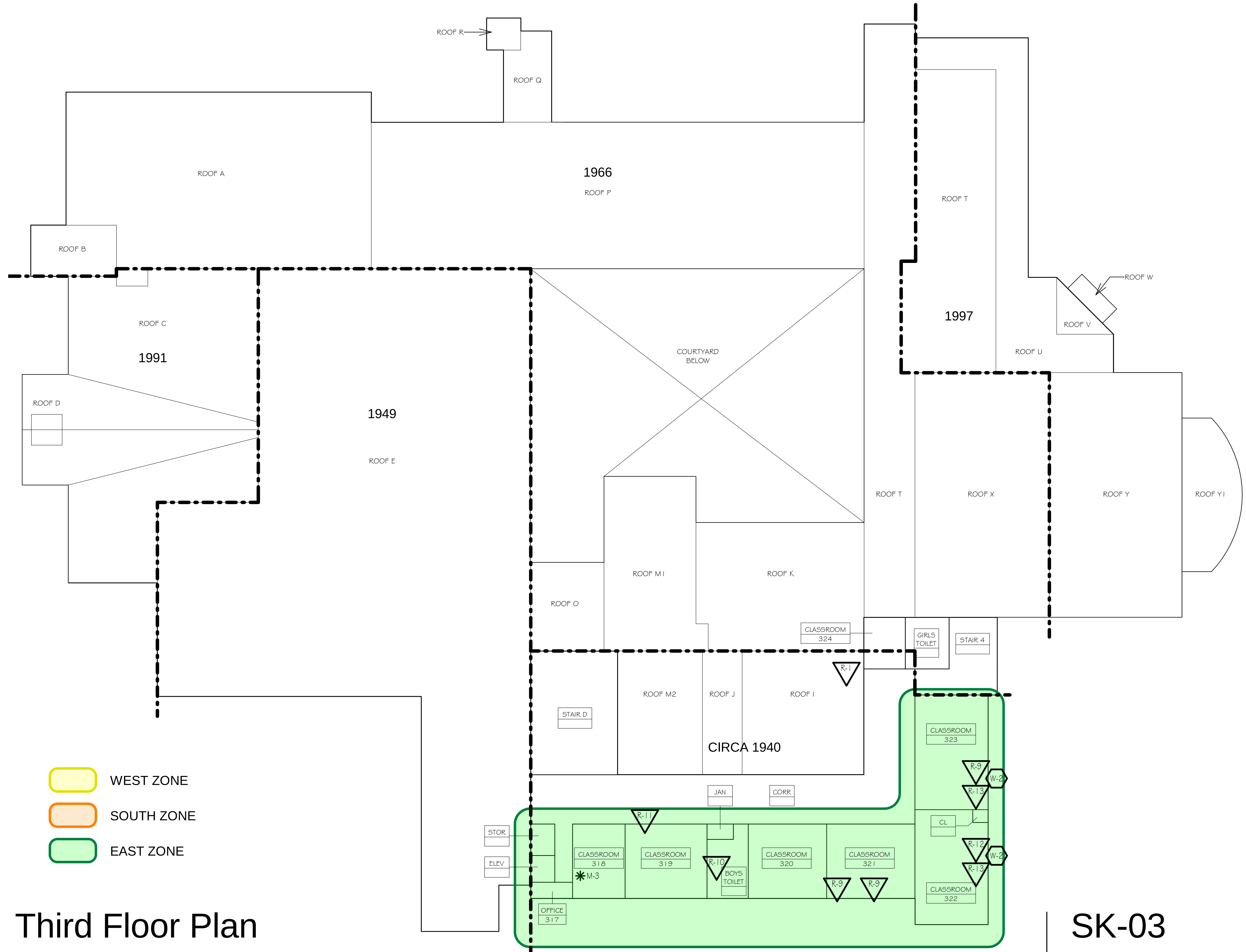
R-10	STAINED CEILING PANEL - SOURCE NOT IDENTIFIED
R-11	ROOF DRAIN LEAK
R-12	STAINED WALL - SOURCE NOT IDENTIFIED
R-13	SUSPECTED ROOF LEAK AT PARAPET OR SCUPPER
R-14	DOWNSPOUT DISCONNECTED FROM UNDERGROUND STORM LINE
R-15	POOR STORM WATER MANAGEMENT - STORMWATER DISCHARGE AT FOUNDATION

WATER DAMAGE KEY NOTES MOLD OBSERVED

M-1	MOLD ON CEILING PANEL
M-2	MOLD ON PIPE INSULATION
M-3	MOLD ON GYPSUM BOARD
M-4	MOLD ON CEILING MOUNTED SUPPLY / RETURN AIR GRILLE
M-5	MOLD ON CARPET
M-6	MOLD ON WALL
M-7	MOLD BENEATH VCT



Cole&DennyArchitects

333 North Fairfax Street
Alexandria, VA 22314

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Third Floor Plan

Mt Vernon Community School - Water Intrusion Assessment
Water Intrusion Survey

2601 Commonwealth Ave
Alexandria, VA 22301

SK-03

13002.11

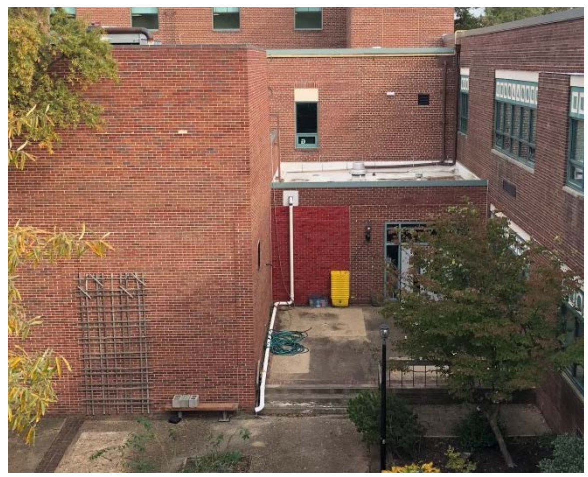
DATE: 11/15/18

WATER INTRUSION SURVEY - REPRESENTATIVE PHOTOS


R-1 Deteriorated roof membrane.


Clogged roof drain.


R-14 Downspout disconnected from storm line.


R-15 Poor storm water management.


High levels of humidity and condensation.

WATER INTRUSION SURVEY - REPRESENTATIVE PHOTOS


Poor vapor barrier and no insulation.


Uninsulated EIFS infill.


H-1 Deteriorated insulation on HVAC piping.


H-2 No insulation on refrigerant piping- condensation.


M-1 Mold on ceiling panel.


M-2 Mold on gypsum board.

Peer Review: Roofing Replacement / Mt. Vernon Community School

Date: 15 November 2018
Project: ACPS Mount Vernon Water Assessment
Project No.: 13002.11
Report By: Louis Barbieri Jr., RA, AIA

Cole & Denny Architects (CDA) was engaged to provide Peer Review services of the “Roof Replacement” construction documents prepared by Restoration Engineering, Inc. dated May 2, 2018. CDA’s review included a site visit on November 1, 2018 to review existing conditions. CDA accepts no professional liability for the construction documents produced by Restoration Engineering, Inc., nor are these comments design directives. These comments shall be reviewed by the Architect and/or Engineer of record and incorporated at his or her discretion. An annotated copy of the above referenced construction documents is attached by reference to this review.

Below is a summary of our findings.

General Comments:

- The existing roofing is beyond its usable life and should be replaced as soon as possible. During rain events, active leaks are visible throughout the building. CDA has also been engaged by ACPS to review existing humidity, condensation and envelope issues throughout the building. The compromised roofing is contributing to the overall humidity and condensation issues throughout the building.
- The existing roof layout and proposed design by Restoration Engineering, Inc. drains many roof sections through primary roof scuppers and in many cases these scuppers are drained onto adjacent lower roof sections, collected in another scupper and day-lighted on grade. This causes a large amount of rain water run-off, presents opportunities for ground level flooding, and roofing leaks. We recommend looking into ways to provide primary roof drains and internal rain leaders to tie into the storm system.
- The PDF’s of the plans and details were plotted in color. Plotting hardcopies of the documents is costly to bidders, contractors, and subcontractors. Printing the color

documents in black & white presents legibility issues. Consider making the PDF's in black and white and modifying as necessary for clarity.

- The contract documents are not stamped by a professional architect or engineer. While the City of Alexandria may not require the drawings be sealed by a professional for permitting purposes, ACPS may want to consider making this a requirement on future projects. ACPS can refer to the State's "Construction & Professional Services Manual" for their roofing replacement requirements as a basis of consideration.

Sheet C1.0

- Sheet C1.0 "General Note" #1 – The applicable code for the City of Alexandria is the 2012 Virginia Construction Code, not the IBC, IPC or IECC. Update accordingly.
- Sheet C1.0 "Code Information" #1, 2 & 3 – Update code reference to 2012 VCC
- Sheet C1.0 "Code Information" #4 – The 2015 VECC has not be adopted by the City. Per the 2012 VECC, the required roof R-value is R-25ci. Update the code information and specifications accordingly.
- Sheet C1.0 Phasing Plan is titled "Decking/Slope Key."
- Sheet C1.0 coordinate the phasing diagram with ACPS.
- Sheet C1.0 Decking/Slope Key – Hatch patterns for roof slopes are difficult to read. Consider another means to convey information.
- Sheet C1.0 Decking/Slope Key – Roof Area "X" is a flat roof and "Y" is a barrel. Update the hatch pattern accordingly.

Sheet A-1.0

- 1/A-1.0 "Roofing Plan – Existing, Roof Area "A": Roof Correct Keyed Note reference to roof drain near AHU's.
- 2/A-1.0 "Roof Walkway Plan" – Suggest adding walkway to Roof Area "X".
- Keyed Demolition Note 13 – Can the existing tubular daylighting devices be salvaged and reinstalled? They appear to be relatively new.

Cole&DennyArchitects

Sheet A-1.1

- 1/A-1.1 “Partial Roof Plan” – Cricket layout results in one curb in a valley. Consider revising.
- 1/A-1.1 “Partial Roof Plan” – Consider providing coping protection at access ladders.
- 1/A-1.1 “Partial Roof Plan” Currently a portion of Roof P drains on to Roof Q. Consider revising drainage design to provide a more direct means of shedding storm water.
- A-1.1 Legend – The Virginia Plumbing code requires the smallest dimension of a scupper to be no less than 4”. Consider revising design.

Sheet A-1.2

- 1/A-1.2 “Partial Roof Plan” - There are no existing or proposed roof drains on Roof E. Consider redesigning drainage to provide roof drains and internal rain leaders.
- 1/A-1.2 “Partial Roof Plan” – Consider providing coping protection at access ladders.
- 1/A-1.2 “Partial Roof Plan” - Correct detail references at the wall flashing and window.
- 1/A-1.2 “Partial Roof Plan” – Roof G has a scupper that drains to a disconnected pipe at grade. Consider revising draining to provide a roof drain and internal rain leader.

Sheet A-1.3

- 1/A-1.3 “Partial Roof Plan” – Several roof areas drain onto adjacent roofs prior to discharging on grade.
- 1/A-1.3 “Partial Roof Plan” – Consider providing coping protection at access ladders.
- 1/A-1.3 “Partial Roof Plan” – The slope of Roof N1 and Roof I do not drain towards roof drain. Consider revising.
- 1/A-1.3 “Partial Roof Plan” – Roof M1, provide overflow drainage.

Sheet A-1.4

- 1/A-1.4 “Partial Roof Plan” – Revise key note at roof drain.
- 1/A-1.4 “Partial Roof Plan” – Consider providing step-over ladder to access Roof X.

Sheet A-5.1

- Revise indicated key noted.

- 5/A-5.1 – Provide edits as noted.

Sheet A-5.3

- 3&4 /A-5.3 – Consider providing membrane support and insulation at expansion joint.

Sheet A-5.4

- 8/A-5.4 – Provide door schedule and hardware specification.
- 7&8 /A-5.4 – Provide edits as noted.

Sheet A-5.5

- 1&3 /A-5.4 – Consider providing membrane support and insulation at expansion joint.
- 6&8 /A-5.4 – Specify width of scupper trough.
- 8 /A-5.4 – Clarify new vs. ETR gutter.
- 9/A-5.4 – Recommend painting perimeter steel beam.

Sheet A-5.7

- 1/A-5.7 – Recommend replacing or modifying existing ladder at the roof hatch to accommodate the higher curb.

Sheet A-5.8

- 5/A-5.8 – Specify height of new steel columns/RTU supports.

ROOF REPLACEMENT
MOUNT VERNON COMMUNITY SCHOOL

2601 COMMONWEALTH AVENUE
ALEXANDRIA, VIRGINIA 22305

PREPARED FOR:
ALEXANDRIA CITY PUBLIC SCHOOLS
1340 BRADDOCK PLACE, SUITE 620
ALEXANDRIA, VIRGINIA 22314
PH: (703) 619-8181 F: (703) 619-8090

BID SET

DOCUMENTS PREPARED BY:
RESTORATION ENGINEERING, INC.
10503 WEST DRIVE, SUITE A
FAIRFAX, VIRGINIA 22030
PH: (703) 272-7787 F: (703) 272-7796

IMAGE - COPYRIGHT 2018 GOOGLE EARTH

REGIONAL MAP

IMAGE - COPYRIGHT 2018 GOOGLE EARTH

SATELLITE IMAGE

Applicable code should be 2012 Virginia Construction Code

Applicable code should be 2012 Virginia Energy Conservation Code

Confirm this is correct with ACPS

Title "Phasing Key," not "Decking/Slope Key"

Confirm phasing meets the needs of ACPS. For example, some identified in Phase II are is severe need of replacement and some areas in Phase I are in better condition

GENERAL NOTES:

1. THE REPAIRS DETAILED IN THESE CONSTRUCTION DRAWINGS WERE DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2012 INTERNATIONAL BUILDING CODE, THE 2012 INTERNATIONAL PLUMBING CODE, AND THE 2012 INTERNATIONAL ENERGY CONSERVATION CODE.
2. THE "WORK" INCLUDES REMOVAL OF THE EXISTING LOW SLOPE ROOFING SYSTEMS AND ASSOCIATED FLASHINGS ON SPECIFIED ROOF SECTIONS. THE "WORK" ALSO INCLUDES MISCELLANEOUS REPAIRS TO BRICK FACADE.
3. **ADD ALTERNATE 1** – REMOVE AND REPLACE EXISTING GAS LINES.
4. THE "WORK" DOES NOT INVOLVE MODIFICATION TO, OR INSTALLATION OF ADDITIONAL ELECTRICAL AND/OR MECHANICAL APPURTENANCES OTHER THAN RELOCATION OF EXISTING ELECTRICAL/REFRIGERATION LINES SERVICING VARIOUS SMALL HEAT PUMPS.
5. PLUMBING WORK INCLUDES REPLACEMENT OF EXISTING ROOF DRAINS AND INSTALLATION OF NEW DRAINS, RELOCATION OF NUMEROUS DRAIN OPENINGS TO FACILITATE DRAINAGE, INSTALLATION OF NEW DRAIN LINES AND TIE INS TO EXISTING DRAIN LINES AND, ELIMINATION OF EXISTING DRAINS AND CAPPING OF ABANDONED DRAIN LINES AT ISOLATED LOCATIONS.
6. CONTRACTOR TO ACQUIRE ALL NECESSARY PERMITS IN ACCORDANCE WITH LOCAL JUDICIAL AUTHORITIES PRIOR TO COMMENCEMENT OF "WORK".
7. CONTRACTOR TO COORDINATE THE NECESSARY INSPECTIONS AS REQUIRED BY LOCAL JUDICIAL AUTHORITIES.

Applicable code should be 2012 Virginia Construction Code

CODE INFORMATION:

1. BUILDING USE GROUP: E (IBC 2012, SECTION 305.1)
2. CONSTRUCTION TYPE: TYPE 2A (IBC 2012, TABLE)
3. FIRE CLASSIFICATION: CLASS (IBC 2012, TABLE)
4. THERMAL ROOF ENVELOPE REQUIREMENTS: R-30ci (IECC 2015, TABLE C402.1.3)
5. FIRE SUPPRESSION SYSTEM: YES
6. SQUARE FOOTING OF ROOFING BEING REPLACED: 72,000 SF

Not Applicable

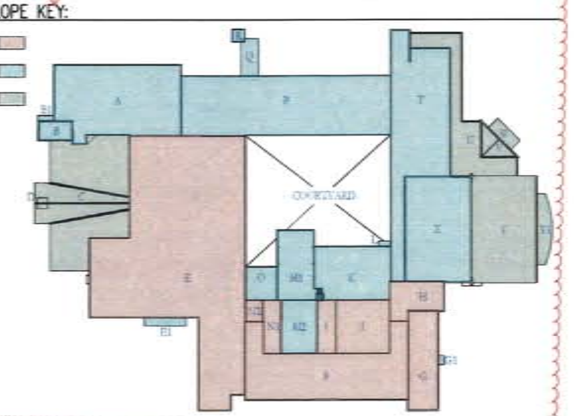
R-25ci if using 2012 VECC as noted above

PHASING NOTES:

1. THE "WORK" SHALL BE PHASED OVER TWO SUMMER CONSTRUCTION PERIODS:
   1.1. PHASE I – 2018
   1.2. PHASE II – 2019
2. THE CONTRACTOR MUST COMPLETE ALL ASPECTS OF THE WORK, INCLUDING ADDRESSING ALL PUNCH LIST ITEMS FOR SPECIFIC ROOF AREAS TO BE CONSIDERED "COMPLETE".
3. THE CONTRACTOR MUST COMPLETE ALL PHASE I WORK STARTED, WITHIN A SPECIFIC SECTION OF ROOFING, DURING PHASE I.
4. THE CONTRACTOR'S SCHEDULE OF VALUES SHALL BE SUBDIVIDED BY ROOF AREAS IN ORDER TO FACILITATE REVIEW OF THE CONTRACTOR'S PAYMENT APPLICATIONS.
5. THE CONTRACTOR WILL BE GRANTED PARTIAL RELEASE OF RETAINAGE FOR ALL WORK AREAS COMPLETED DURING PHASE I PROVIDED THAT ALL PUNCH LIST ITEMS HAVE BEEN ADDRESSED.
6. PROVIDE WARRANTIES FOR EACH COMPLETED PHASE OF THE PROJECT.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE AND REPAIR OF ALL ROOFING SYSTEMS (NEW AND OLD) FOR THE NON CONSTRUCTION PERIOD BETWEEN PHASES I AND II.

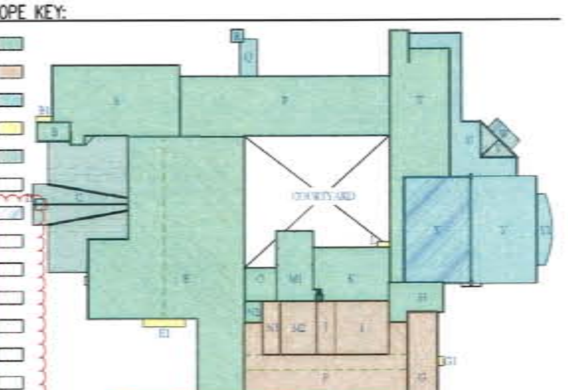
DECKING/SLOPE KEY:

PHASE I
PHASE II
N.I.C.



DECKING/SLOPE KEY:

GYPSUM DECK
WOOD DECK
STEEL DECK
CONCRETE DECK
METAL ROOF
FLAT
BARREL
SLOPED 0.13:12
SLOPED 0.25:12
SLOPED 0.50:12
SLOPED 1.00:12
SLOPED 2.00:12
SLOPED 9.00:12
SLOPED 18.0:12



Hatch patters are a little difficult to read. Consider another means to convey this information.

SHEET INDEX:

SHEET #	SHEET	DESCRIPTION
1 OF 16	C-1.0	COVER SHEET
2 OF 16	A-1.0	DEMOLITION PLAN
3 OF 16	A-1.1	PARTIAL ROOF PLAN
4 OF 16	A-1.2	PARTIAL ROOF PLAN
5 OF 16	A-1.3	PARTIAL ROOF PLAN
6 OF 16	A-1.4	PARTIAL ROOF PLAN
7 OF 16	A-5.1	ROOF DETAILS
8 OF 16	A-5.2	ROOF DETAILS
9 OF 16	A-5.3	ROOF DETAILS
10 OF 16	A-5.4	ROOF DETAILS
11 OF 16	A-5.5	ROOF DETAILS
12 OF 16	A-5.6	ROOF DETAILS
13 OF 16	A-5.7	ROOF DETAILS
14 OF 16	A-5.8	ROOF DETAILS
15 OF 16	A-5.9	ISOMETRIC DETAILS
16 OF 16	A-5.10	ISOMETRIC DETAILS

#	DATE	SUBMISSIONS/REVISIONS

ROOF REPLACEMENT
MOUNT VERNON COMMUNITY SCHOOL
ALEXANDRIA CITY PUBLIC SCHOOLS
2601 COMMONWEALTH AVENUE
ALEXANDRIA, VIRGINIA 22305

RESTORATION ENGINEERING, INC.

COVER SHEET
05/02/2018 BID SET
REP GBG NO SCALE
908.014

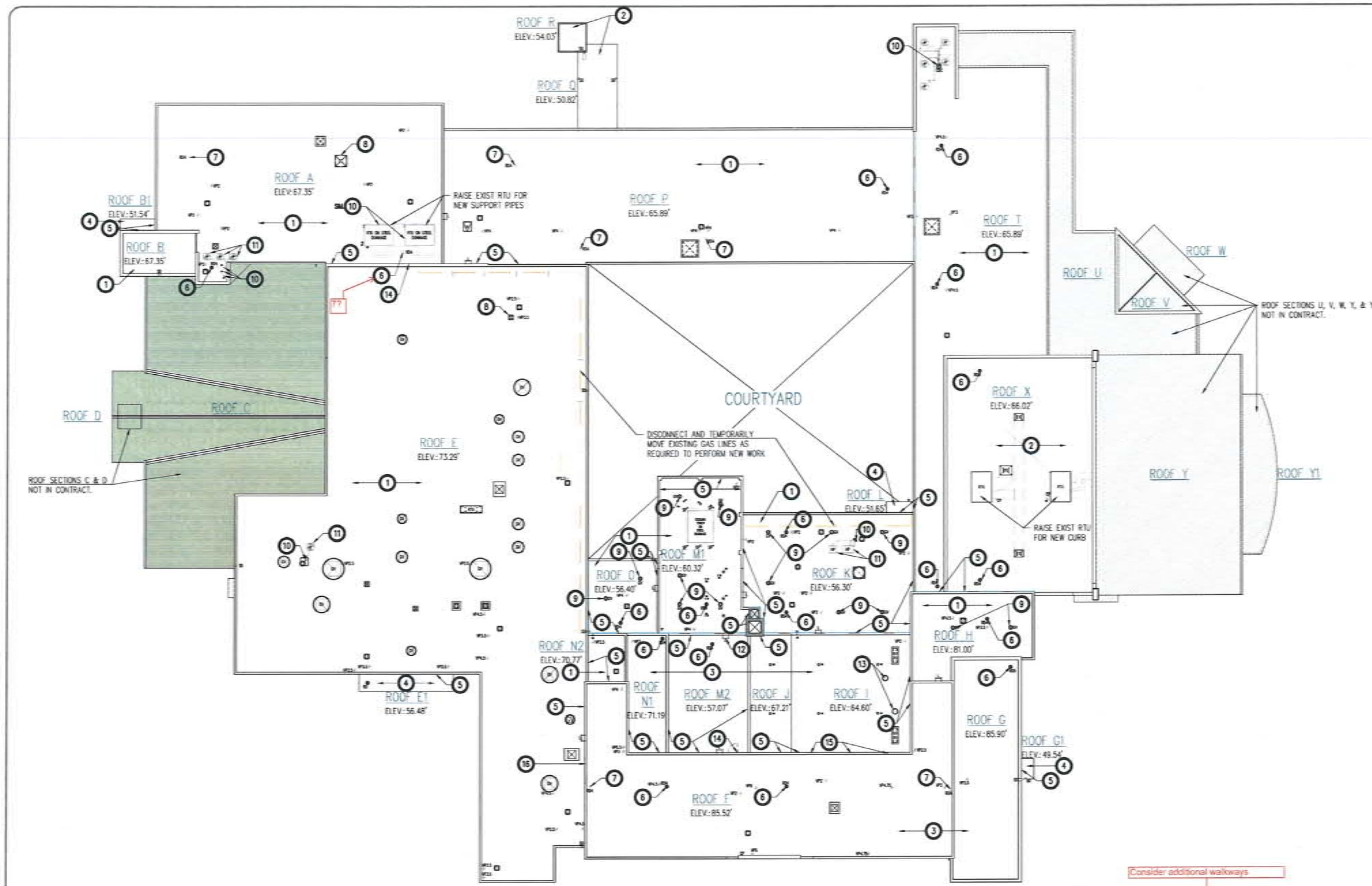
C-1.0

GENERAL DEMOLITION NOTES

1. CONTRACTOR TO PERFORM DEMOLITION IN ACCORDANCE WITH CONTRACT DOCUMENTS AND, SPECIFICALLY, SPECIFICATIONS SECTION 024119 "SELECTIVE STRUCTURE DEMOLITION".
2. CONTRACTOR TO REMOVE AND DISPOSE OF ENTIRETY OF SINGLE PLY ROOFING MEMBRANE AND ASSOCIATED FLASHINGS, INSULATION, INSULATION FASTENERS, METAL FLASHING, BUR, MISCELLANEOUS WOOD BLOCKING/PLYWOOD AND OTHER ROOFING ACCESSORIES DOWN TO THE SURFACE OF THE EXISTING GYPSUM, METAL, AND WOOD ROOF DECKS.
3. CONTRACTOR TO REMOVE EXISTING EXISTING BRICK MASONRY VENEER, AT VARIOUS LOCATIONS, AS REQUIRED TO FACILITATE INSTALLATION OF NEW THROUGH-WALL FLASHING.
4. CONTRACTOR TO REMOVE EXIST BRICK MASONRY AND CONCRETE MASONRY UNIT BACK-UP AT DOOR OPENING THROUGH SECTION F AND M2 EXTERIOR WALLS, AS REQUIRED TO FACILITATE RAISING OF EXTERIOR DOOR OPENING.
5. CONTRACTOR TO REMOVE EXIST BRICK MASONRY AND CONCRETE MASONRY UNIT BACK-UP AT WINDOW OPENINGS THROUGH SECTION F AND I EXTERIOR WALLS, AS REQUIRED TO FACILITATE RAISING OF WINDOW OPENINGS.
6. CONTRACTOR TO REMOVE EXIST BRICK MASONRY AND CONCRETE MASONRY UNIT BACK-UP AT WINDOW OPENING THROUGH SECTION F AND I EXTERIOR WALLS, AS REQUIRED TO FACILITATE RAISING OF WINDOW OPENING.
7. CONTRACTOR TO COORDINATE WITH ALEXANDRIA CITY PUBLIC SCHOOLS MAINTENANCE STAFF FOR TEMPORARY REMOVAL/DISCONNECT OF MECHANICAL EQUIPMENT, DUCT WORK, PIPING AND WIRING AND REINSTALLATION AFTER ROOFING OPERATIONS.
8. PRIOR TO START OF DEMOLITION, CONTRACTOR TO TEST EXISTING STORM DRAIN LINES, TO VERIFY PROPER OPERATION.
9. CONTRACTOR TO PROVIDE TEMPORARY BARRICADES AND OTHER FORMS OF PROTECTION TO PROTECT GENERAL PUBLIC FROM INJURY DUE TO SELECTIVE DEMOLITION WORK. SCHOOL CHILDREN MAY BE PRESENT AT CERTAIN TIMES.
10. PRIOR TO DISCONNECTING ELECTRICAL LINES, CONDUITS, ROOF TOP MECHANICAL UNITS OR DUCTWORK, RETAIN A MECHANICAL SUB-CONTRACTOR TO TEST THE LINES, UNITS AND DUCTS IN THE PRESENCE OF THE OWNER'S SITE REPRESENTATIVE, TO DETERMINE THE CURRENT OPERATING CONDITION. PROVIDE A WRITTEN PRECONSTRUCTION CONDITION REPORT CO-SIGNED BY THE OWNER'S SITE REPRESENTATIVE, THE CONTRACTOR'S AND THE SUBCONTRACTOR'S REPRESENTATIVES STATING THE OPERATING AND PHYSICAL CONDITIONS OF ALL ELECTRICAL LINES, CONDUITS, MECHANICAL EQUIPMENT AND DUCT WORK PRIOR TO STARTING ANY WORK, INCLUDING DISCONNECTING ANY LINES. CONSULT WITH THE SCHOOL PRINCIPAL REGARDING CIRCUIT SHUTDOWN AND SCHEDULING. AFTER TESTING AND SCHEDULING, THE MECHANICAL SUBCONTRACTOR SHOULD DISCONNECT, REMOVE, REROUTE, EXTEND AND RECONNECT OR REPLACE THE LINES AND DUCT WORK TO THE UNITS ON THE AREAS TO BE REROOFED IN ACCORDANCE WITH REQUIREMENTS OF THE CURRENT BUILDING CODES. OPERATING UNITS THAT FAIL TO FUNCTION IN ACCORDANCE WITH THE PRE-CONSTRUCTION CONDITION REPORT AFTER RE-INSTALLATION WILL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT NO COST TO THE CITY OF ALEXANDRIA. AT THE LARGE UNITS ON ROOF SECTION A, LIFT THE UNITS WITH A CRANE AS REQUIRED TO INSTALL NEW DUNNAGE TO RAISE THE EXISTING UNITS 20 INCHES AND FLASH THE NEW POSTS WITH LIQUID FLASHING AS SHOWN ON DETAIL 8/A5-7. AT THE LARGE UNITS ON ROOF SECTION X, LIFT THE UNITS WITH A CRANE AS REQUIRED TO INSTALL RAISE THE EXISTING CURBS AND UNITS 6 INCHES AND FLASH THE RAISED CURBS AS SHOWN ON THE DRAWINGS. AFTER RESETTING THE UNITS, EXTEND EXISTING OR PROVIDE NEW DUCT WORK, ELECTRICAL LINES, MECHANICAL LINES, CONDUITS ETC. AND INSTALL/REINSTALL ALL ITEMS IN ACCORDANCE WITH THE CURRENT BUILDING CODES

KEYED DEMOLITION NOTES

1. REMOVE EXISTING SINGLE-PLY ROOFING MEMBRANE, INSULATION, & BUR DOWN TO THE SURFACE OF EXISTING GYPSUM DECKING AND/OR SLOPED GYPSUM FILL; PATCH DETERIORATED DECKING BEFORE PROCEEDING WITH INSTALLATION OF NEW ROOFING SYSTEMS
2. REMOVE EXISTING SINGLE-PLY ROOFING MEMBRANE, INSULATION, & BUR DOWN TO THE SURFACE OF EXISTING METAL DECK; PATCH DETERIORATED DECKING BEFORE PROCEEDING WITH INSTALLATION OF NEW ROOFING SYSTEM
3. REMOVE EXISTING SINGLE-PLY ROOFING MEMBRANE, INSULATION& BUR DOWN TO THE SURFACE OF EXISTING SLOPED WOOD DECK; PATCH DETERIORATED DECKING BEFORE PROCEEDING WITH INSTALLATION OF NEW ROOFING SYSTEM
4. REMOVE EXISTING SINGLE-PLY ROOFING MEMBRANE, INSULATION & BUR DOWN TO THE SURFACE OF EXISTING CONCRETE DECK; PATCH DETERIORATED DECKING BEFORE PROCEEDING WITH INSTALLATION OF NEW ROOFING SYSTEM
5. REMOVE AND SALVAGE (75% MIN.) EXISTING BRICK MASONRY AS REQUIRED TO INSTALL NEW THROUGH-WALL FLASHINGS
6. REMOVE AND DISCARD EXISTING DRAIN BODY AND DRAIN DOME AT EXISTING DRAIN LOCATION
7. EXISTING ROOF DRAIN LOCATION TO BE ABANDONED; REMOVE DRAIN CAP DRAIN LINE BELOW DECK AND PATCH DECKING
8. EXISTING CAPPED CURB; REMOVE AND PATCH DECKING
9. EXISTING SMALL GRAVITY VENT TO BE ABANDONED; REMOVE AND PATCH DECKING
10. TEST FUNCTION OF UNIT, THEN DISCONNECT AND TEMPORARILY REMOVE EXISTING HEAT PUMP WIRING/ REFRIGERATION LINES AS REQUIRED TO REROUT LINES THROUGH NEW ENCLOSURES (SEE NEW WORK); COORDINATE WORK WITH ONSITE PERSONNEL TO LIMIT DISRUPTION OF SERVICE; PLEASE NOTE THAT CONTRACTOR/ SUBCONTRACTOR WILL ONLY BE ALLOWED TO TAKE 1 UNIT OUT OF SERVICE AT A TIME. REINSTALL UNIT.
11. REMOVE AND DISCARD EXISTING 4" X 4" TREATED WOOD SLEEPERS
12. EXISTING FASTENERS AND INSTALL NEW ANCHORS AT EXIST LADDER (SEE KEYED NOTE 9 FOR NEW WORK)
13. REMOVE AND DISCARD EXISTING SKYLIGHT ASSEMBLY; INSTALL TEMPORARY PROTECTION IN ACCORDANCE WITH ALL APPLICABLE FALL PROTECTION GUIDELINES UNTIL REPLACEMENT SKYLIGHTS ARE INSTALLED
14. REMOVE AND DISCARD EXIST DOOR (SEE KEYED NOTE 10 NEW WORK)
15. REMOVE AND DISCARD EXIST WINDOW (SEE KEYED NOTE 11 NEW WORK)
16. REMOVE AND DISCARD EXIST WINDOW (SEE KEYED NOTE 11 NEW WORK)

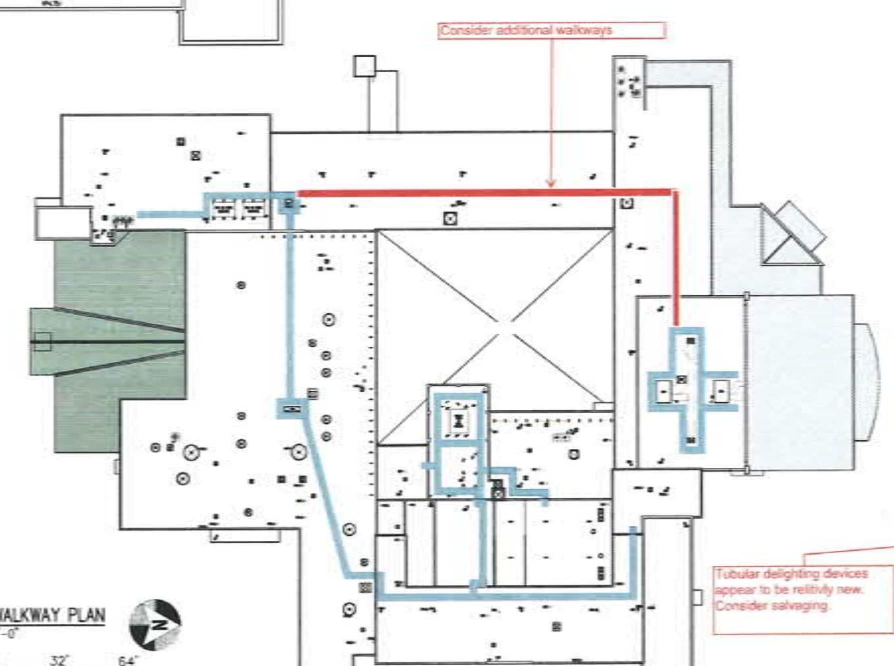


1 A1.0 ROOF PLAN - EXISTING 1/16" = 1'-0"

16' 8' 0 16' 32'
1/16" = 1'-0"

GENERAL CONSTRUCTION NOTES

1. CONTRACTOR SHALL FABRICATE METAL COPINGS ON FASCIA SO BOTTOM OF METAL IS 1-INCH BELOW BOTTOM OF COPING BED JOINT.
2. REPLACE ALL EXISTING SEALANT IN CONTROL JOINTS OF MASONRY WALLS FROM LOWER ROOF SECTIONS TO ROOF ABOVE. REMOVE EXISTING BACKER ROD AND SEALANT. USE GRINDER ON MASONRY SURFACE AS REQUIRED TO REMOVE ALL SEALANT. INSTALL NEW BACKER ROD AND SEALANT.
3. INSTALL WALKWAYS AS SHOWN ON ROOF WALKWAY PLAN 2/A1.0.



2 A1.0 ROOF WALKWAY PLAN 1/32" = 1'-0"

32' 16' 0 32' 64'
1/32" = 1'-0"

#	DATE	SUBMISSIONS/REVISIONS
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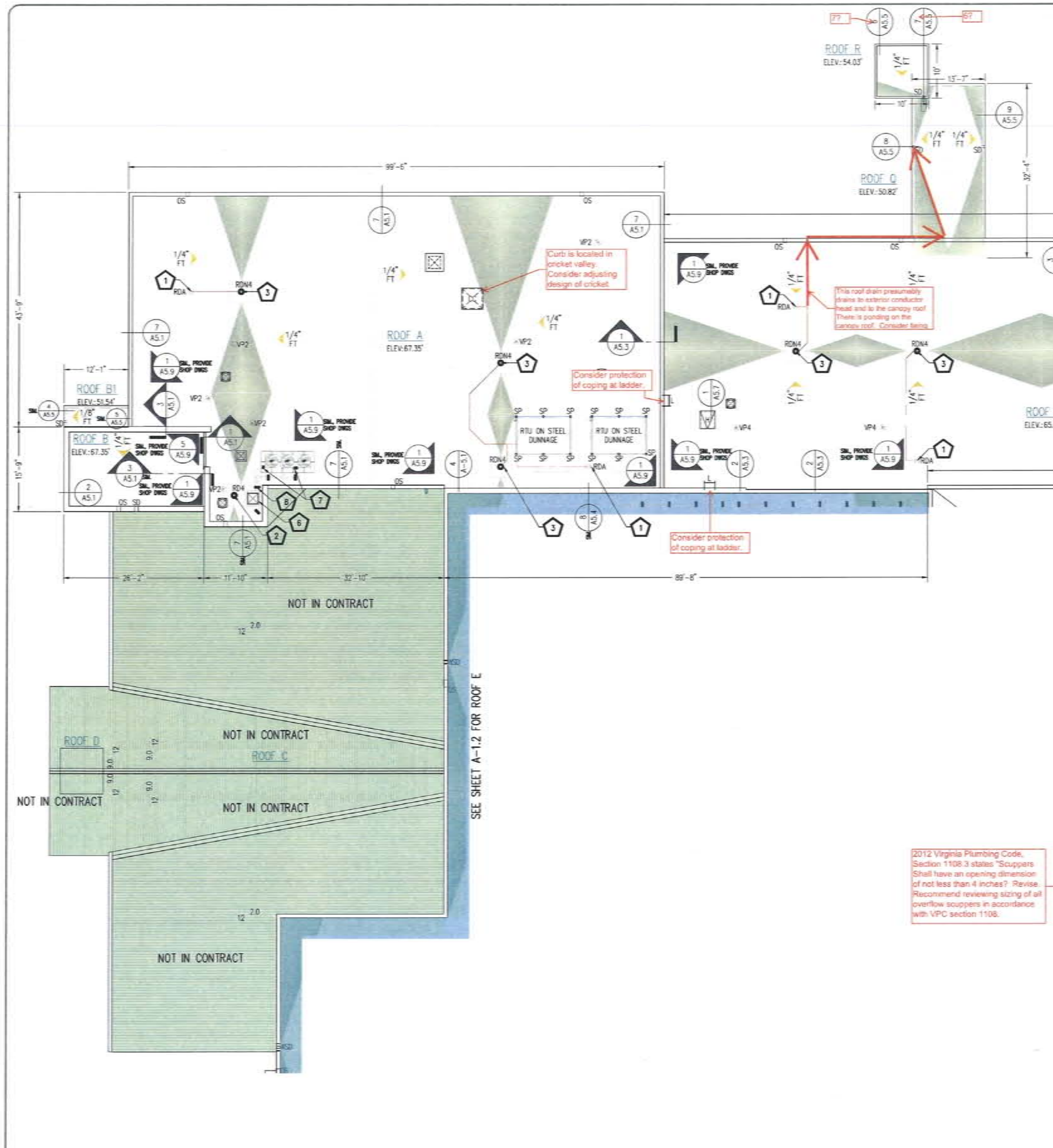
ROOF REPLACEMENT
MOUNT VERNON COMMUNITY SCHOOL
ALEXANDRIA CITY PUBLIC SCHOOLS
2601 COMMONWEALTH AVENUE
ALEXANDRIA, VIRGINIA 22305

RESTORATION ENGINEERING, INC.

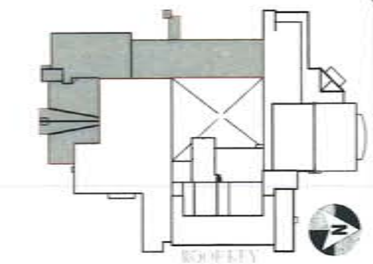
PLAN
05/02/2018 BID SET
REP GBG AS NOTED
908.014

A-1.0

2 OF 16



1 / A1.1 PARTIAL ROOF PLAN (A, B, B1, C, D, P, Q, & R) – C & D NOT IN CONTRACT
1/8" = 1'-0"



LEGEND

	EDGE OF ROOF/PARAPET
	EXISTING EXPANSION JOINT
	PERIMETER BLOCKING
	EXIST GAS LINE ON NEW SUPPORT W/ INTEGRAL UNISTRUT
	DECK SLOPE BOUNDARY
0.2 / 12	SLOPE OF EXISTING STRUCTURAL DECK
1/4" / FT	SLOPE AND ORIENTATION OF NEW TAPERED INSULATION
	SLOPE AND ORIENTATION OF NEW TAPERED INSULATION CRICKETS; NOTE: CRICKETS TO BE FABRICATED FROM ½" PER FT TAPERED INSULATION WITH A 1:3 RATIO (RISE TO RUN) UNLESS OTHERWISE INDICATED
RDA	EXISTING ROOF DRAIN TO BE ABANDONED/INFILL DECK
RD4	REPLACE EXIST ROOF DRAIN (NUMBER=DRN #) W/ NEW CAST IRON DRAIN
	EXIST DRAIN LINE
	INSTALL CAST IRON DRAIN LINE
RDN4	INSTALL ROOF DRAIN (NUMBER=DRN #)
	EXTENT OF DRAIN SUMP (4' SQUARE TYP.)
OD	INSTALL OVERFLOW DRAIN
	INSTALL OVERFLOW DRAIN LINE
SD	EXISTING SCUPPER DRAIN TO BE REPLACED
WSD	WIDEN EXIST SCUPPER DRAIN
OS	INSTALL 3x8 OVERFLOW SCUPPER (UNLESS OTHERWISE NOTED)
VP4	EXISTING VENT PIPE TO REMAIN (NUMBER= #)
SP	SUPPORT PENETRATION (NEW & EXIST)
PP	EXISTING PIPE PENETRATION TO REMAIN
CP	EXISTING CONDUIT PENETRATION TO REMAIN
PPA	EXISTING PITCH POCKET TO BE ABANDONED
GN	EXISTING GOOSENECK VENT TO REMAIN
HS	EXISTING HOT STACK TO REMAIN
RV	EXISTING ROOF VENT TO REMAIN
	EXISTING EXHAUST FAN TO REMAIN
GV	EXISTING GRAVITY VENT TO REMAIN
	REPLACE EXISTING SKYLIGHT
H	REPLACE EXISTING ROOF HATCH
	REPLACE EXISTING ROOF ACCESS DOOR
L	EXIST ACCESS LADDER
	SET EXIST ROOFTOP HEAT PUMP ON CONCRETE PAVERS
	EXISTING MECH. EXHAUST/INTAKE TO REMAIN
RTU	EXISTING ROOFTOP UNIT TO REMAIN

GENERAL CONSTRUCTION NOTES

1. CONTRACTOR SHALL FABRICATE METAL COPINGS ON FASCIA SO BOTTOM OF METAL IS 1-INCH BELOW BOTTOM OF COPING BED JOINT.
2. REPLACE ALL EXISTING SEALANT IN CONTROL JOINTS OF MASONRY WALLS FROM LOWER ROOF SECTIONS TO ROOF ABOVE. REMOVE EXISTING BACKER ROD AND SEALANT. USE GRINDER ON MASONRY SURFACE AS REQUIRED TO REMOVE ALL SEALANT. INSTALL NEW BACKER ROD AND SEALANT.
3. INSTALL WALKWAYS AS SHOWN ON ROOF WALKWAY PLAN 2/A1.0.

KEYED NOTES:

1. EXISTING ROOF DRAIN LOCATION TO BE ABANDONED; SEE DEMOLITION PLAN
2. REPLACE EXIST DRAIN BODY W/ NEW CAST IRON DRAIN BOWL AND CONNECT TO EXISTING DRAIN LINE IAW APPLICABLE PLUMBING CODE REQUIREMENTS; WATER TEST DRAIN AND DRAIN LINE; INSULATE DRAIN BOWL AND DRAIN LINE;
3. INSTALL NEW CAST IRON DRAIN BOWL AT NEW DRAIN LOCATION AS INDICATED; INSTALL NEW DRAIN LINE AND CONNECT/TIE-IN TO EXISTING DRAIN LINE IAW APPLICABLE PLUMBING CODE REQUIREMENTS (NOT THAT CONFIGURATION OF NEW DRAIN LINE IS SCHEMATIC ONLY AND ROOFER/PLUMBER MUST INVESTIGATE EXISTING CONDITIONS TO DETERMINE OPTIMUM LAYOUT FOR NEW DRAIN LINES; WATER TEST DRAIN AND DRAIN LINE; INSULATE DRAIN BOWL AND DRAIN LINE.
4. INSTALL NEW OVERFLOW CAST IRON DRAIN BOWL AND OVERFLOW DRAIN LINE AND EXTEND THROUGH EXTERIOR WALL AND TERMINATE W/ BRONZE LAMBS TONGUE AS SHOWN ON DETAILS 4/A5.6 & 5/A5.6 (NOTE THAT CONFIGURATION /LOCATION OF NEW OVERFLOW DRAIN AND ASSOCIATED DRAINS ARE SCHEMATIC ONLY AND ROOFER PLUMBER MUST INVESTIGATE EXISTING CONDITIONS TO DETERMINE OPTIMUM LAYOUT FOR NEW OVERFLOW DRAIN LINES; INSULATE OVERFLOW DRAIN BOWL AND DRAIN LINE.
5. FABRICATE AND INSTALL NEW 12" SQUARE MULTIPLE CONDUIT ENCLOSURE CURB AND COVER ASSEMBLY IAW DETAIL 6/A5.6; NOTE THAT EXACT LOCATION OF CONDUIT ENCLOSURES MAY VARY DEPENDING UPON OPTIMUM LOCATION WITHIN THE CEILING SPACE; ENGAGE A QUALIFIED MECHANICAL SUBCONTRACTOR TO REROUTE EXISTING HEAT PUMP ELECTRICAL AND REFRIGERANT LINES THROUGH NEW CONDUIT ENCLOSURES; TEST EQUIPMENT TO VERIFY PROPER OPERATION, INSULATE ALL REFRIGERANT LINES IAW APPLICABLE CODE REQUIREMENTS
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7. ENGAGE A QUALIFIED MECHANICAL/ELECTRICAL CONTRACTOR TO INSTALL NEW ELECTRICAL SHUTOFF BOX MOUNTED ON UNISTRUT MAST/BASE AS SHOWN ON DETAIL 8/A5.6
8. INSTALL FOAM SUPPORTS (SPACED 5' O.C., TYP.) W/ INTEGRAL "UNISTRUTS" (DET. 7/A5.6), BENEATH ROOFTOP REFRIGERANT/CONDUIT LINES, TYP.; SECURE CONDUITS TO UNISTRUT W/ SS PIPE CLAMPS DESIGNED TO ENGAGE W/CHANNEL
9. REINSTALL EXISTING LADDER AT LOCATION INDICATED
10. REMOVE EXISTING DOOR AND RAISE OPENING IAW 8/A5.4; FOLLOWING INSTALLATION OF NEW SILL FLASHING/THROUGH WALL FLASHING, RESET MASONRY AND INSTALL NEW DOOR ASSEMBLY
11. REMOVE EXISTING WINDOW ASSEMBLY AND RAISE OPENING IAW 7/A5.4; FOLLOWING INSTALLATION OF NEW SILL FLASHING/THROUGH WALL FLASHING, RESET MASONRY AND INSTALL NEW WINDOW ASSEMBLY

#	DATE	SUBMISSIONS/REVISIONS
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ROOF REPLACEMENT
MOUNT VERNON COMMUNITY SCHOOL
ALEXANDRIA CITY PUBLIC SCHOOLS
2601 COMMONWEALTH AVENUE
ALEXANDRIA, VIRGINIA 22305

RESTORATION ENGINEERING, INC.

PARTIAL PLANS
05/02/2018 BID SET
REP GBG AS NOTED
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A – 1.1

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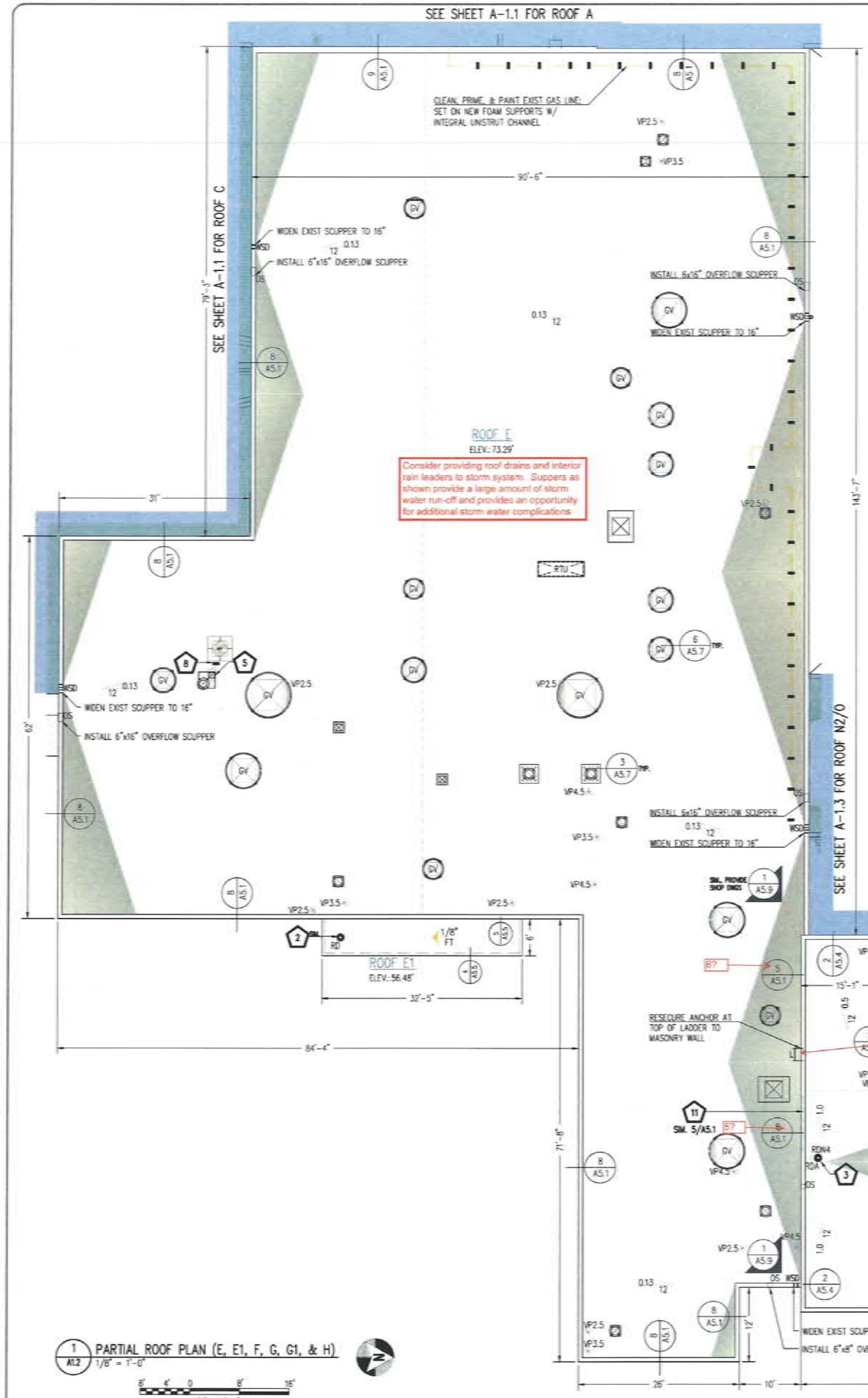

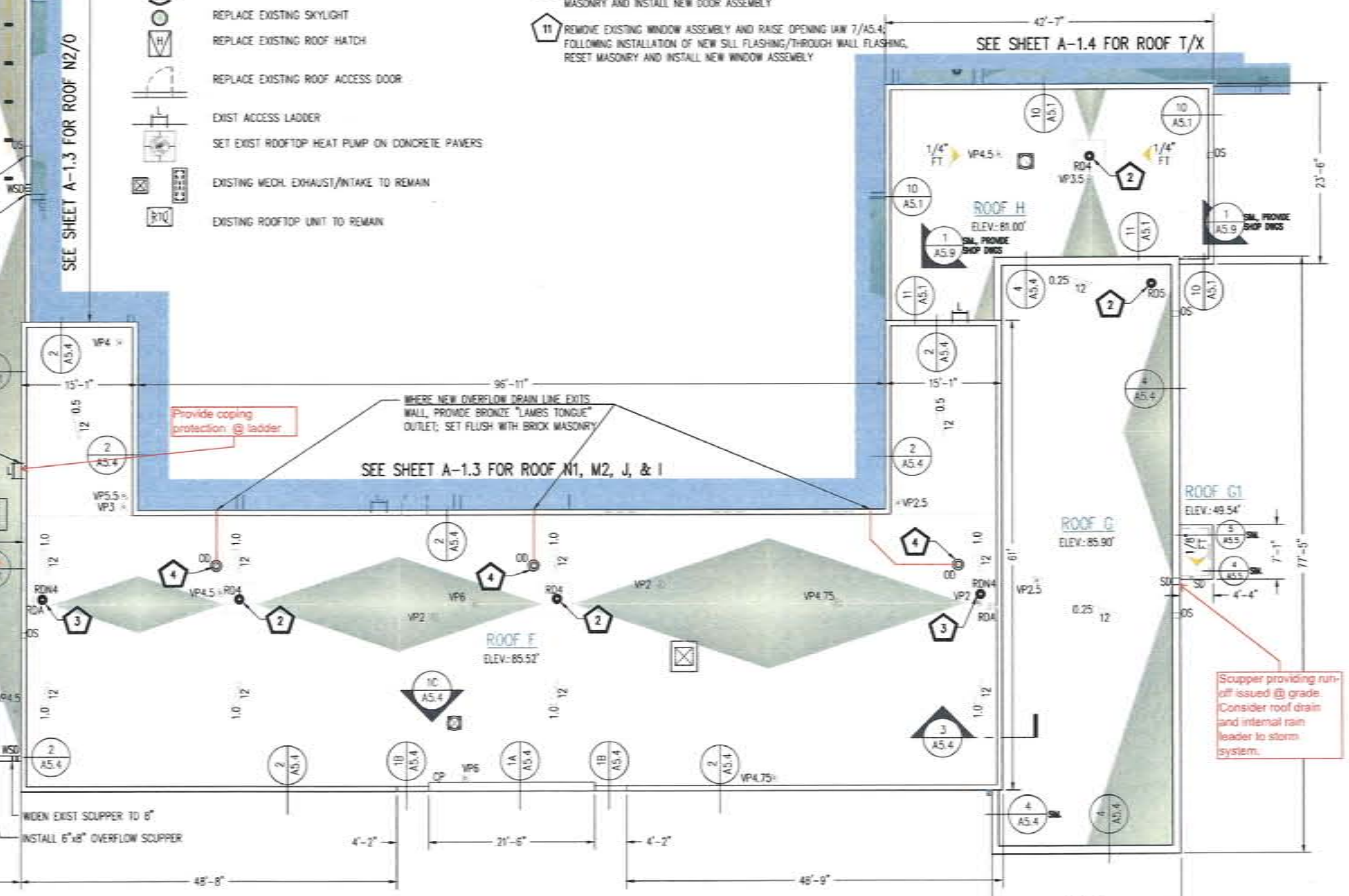

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A1.2 1/8" = 1'-0"

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LEGEND

	EDGE OF ROOF/PARAPET
	EXISTING EXPANSION JOINT
	PERIMETER BLOCKING
	EXIST GAS LINE ON NEW SUPPORT W/ INTEGRAL UNISTRUT
	DECK SLOPE BOUNDARY
0.2 / 12	SLOPE OF EXISTING STRUCTURAL DECK
1/4" FT	SLOPE AND ORIENTATION OF NEW TAPERED INSULATION
	SLOPE AND ORIENTATION OF NEW TAPERED INSULATION CRICKETS; NOTE: CRICKETS TO BE FABRICATED FROM ½" PER FT TAPERED INSULATION WITH A 1:3 RATIO (RISE TO RUN) UNLESS OTHERWISE INDICATED
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	EXIST DRAIN LINE
	INSTALL CAST IRON DRAIN LINE
RDN4	INSTALL ROOF DRAIN (NUMBER=DRN #)
	EXTENT OF DRAIN SUMP (4' SQUARE TYP.)
OD	INSTALL OVERFLOW DRAIN
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	SET EXIST ROOFTOP HEAT PUMP ON CONCRETE PAVERS
	EXISTING MECH. EXHAUST/INTAKE TO REMAIN
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GENERAL CONSTRUCTION NOTES

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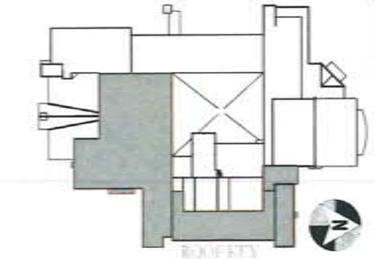

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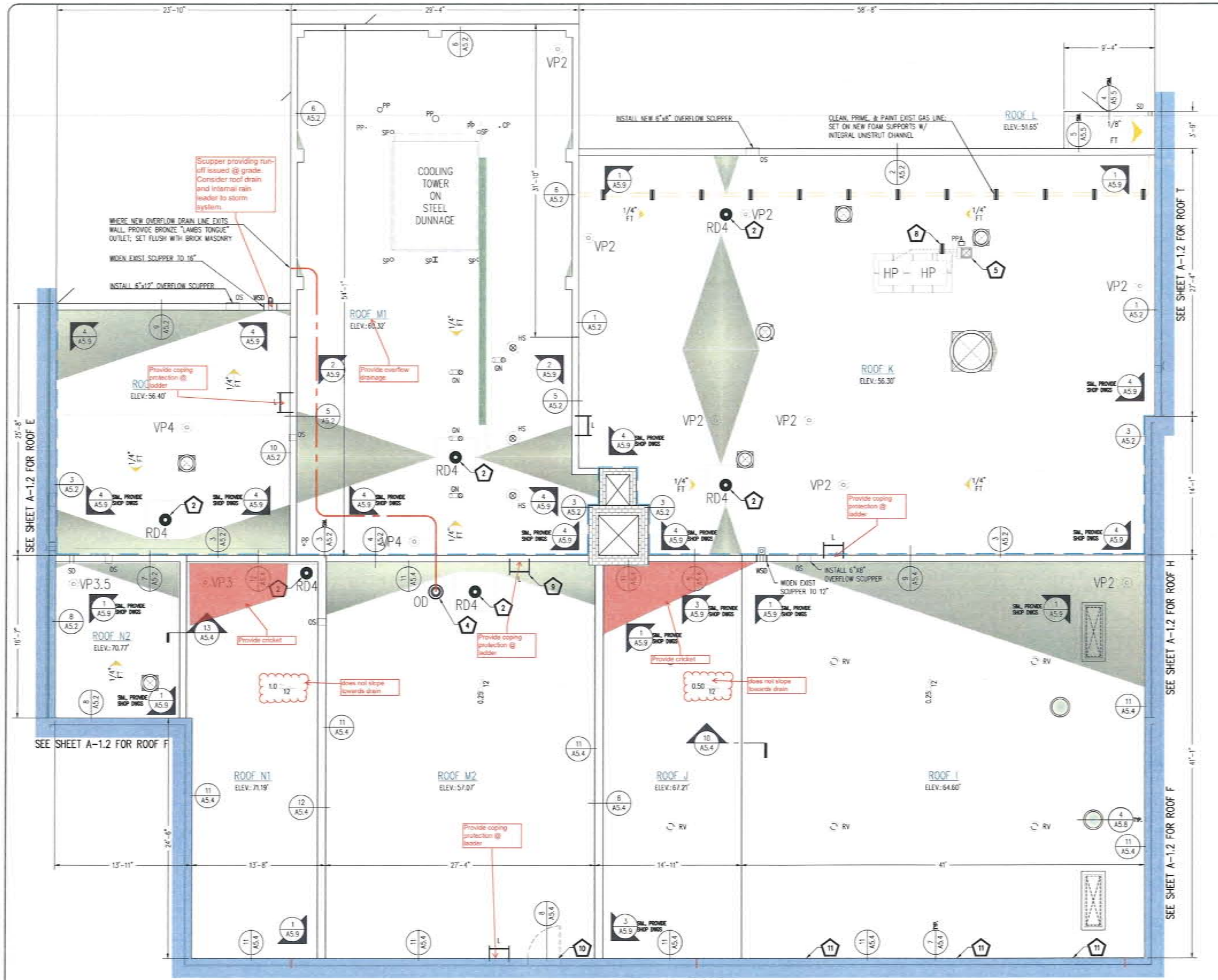

1 / A1.3 PARTIAL ROOF PLAN (I, J, K, L, M1, M2, N1, N2, & O)
1/4" = 1'-0"

4' 2' 0 4' 8'
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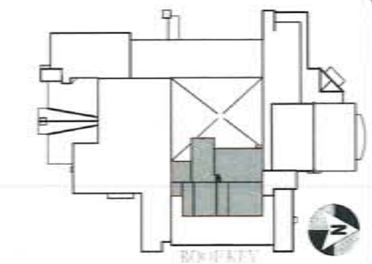

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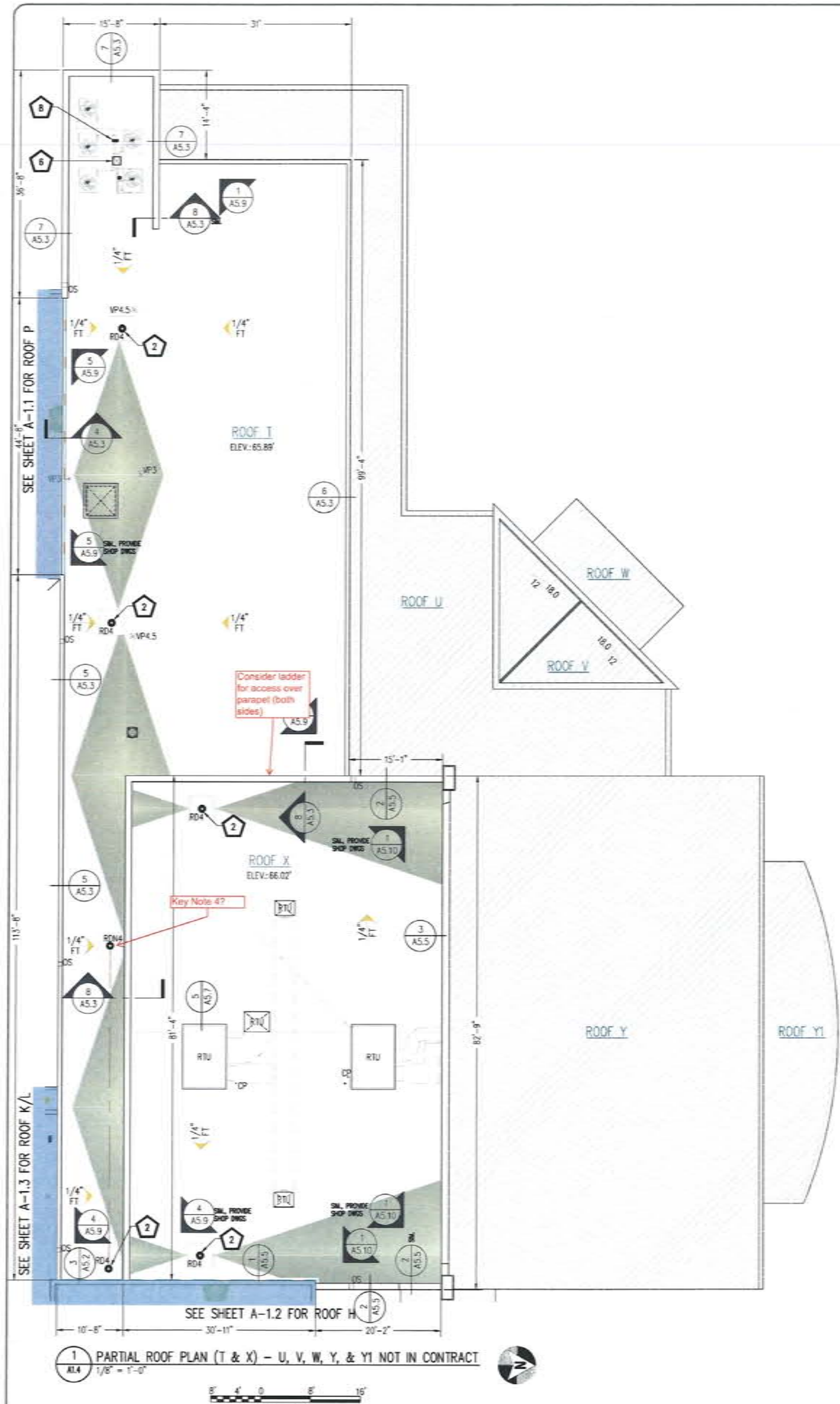
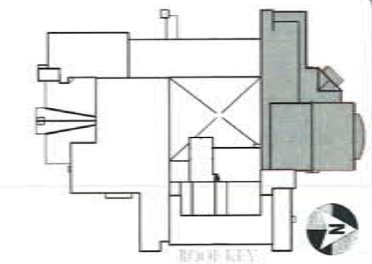


1 A1.4 PARTIAL ROOF PLAN (T & X) – U, V, W, Y, & Y1 NOT IN CONTRACT
1/8" = 1'-0"



LEGEND

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11. REMOVE EXISTING WINDOW ASSEMBLY AND RAISE OPENING IAW 7/A5.4; FOLLOWING INSTALLATION OF NEW SILL FLASHING/THROUGH WALL FLASHING, RESET MASONRY AND INSTALL NEW WINDOW ASSEMBLY

#	DATE	SUBMISSIONS/REVISIONS

ROOF REPLACEMENT
MOUNT VERNON COMMUNITY SCHOOL
ALEXANDRIA CITY PUBLIC SCHOOLS
2601 COMMONWEALTH AVENUE
ALEXANDRIA, VIRGINIA 22305

RESTORATION ENGINEERING, INC.

PARTIAL PLANS
05/02/2018 BID SET
REP GBG AS NOTED
908.014

A-1.4

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1. 60 MIL FIBERGLASS REINFORCED POLYVINYL CHLORIDE (PVC) ROOFING MEMBRANE SET IN BONDING ADHESIVE
2. MFCT.'S RECOMMENDED FLASHING MEMBRANE SET IN BONDING ADHESIVE
3. HOT AIR WELD MEMBRANE SPLICE/SEAM
4. LAP SEALANT
5. MFCT.'S RECOMMENDED COVERBOARD; ADHERE TO SUBSTRATE USING MFCT.'S RECOMMENDED POLYURETHANE SPRAY ADHESIVE INSTALLED IAW MFCT.'S APPROVED COVERAGE/PATTERN
6. 2½" THICK POLYISOCYANURATE INSULATION; SET IN MFCT.'S RECOMMENDED POLYURETHANE ADHESIVE INSTALLED IAW MFCT.'S APPROVED COVERAGE/PATTERN; INSTALL IAW APPROVED SHOP DRAWINGS
7. 3" THICK BASE LAYER POLYISOCYANURATE INSULATION; FASTEN IAW APPROVED SHOP DRAWINGS
8. TAPERED POLYISOCYANURATE INSULATION; SLOPES AND CONFIGURATIONS VARY (SEE ROOF PLAN); SET IN MFCT.'S RECOMMENDED POLYURETHANE ADHESIVE INSTALLED IAW MFCT.'S APPROVED COVERAGE/PATTERN; INSTALL IAW APPROVED SHOP DRAWINGS
9. PROVIDE ROOFING MANUFACTURER'S APPROVED FASTENER AND FASTENING PLATE AND INSTALL IAW APPROVED SHOP DRAWINGS INCLUDING PROVISIONS FOR ADDITIONAL FASTENERS AT "PERIMETER" AND "CORNER" AREAS
10. 0.040" ALUM. CONTINOUS CLEAT; FASTEN W/ SS SCREWS (WOOD) OR SS NAILINS (MASONRY); DO NOT OVERDRIVE FASTENERS
11. 0.032" PREFINISHED ALUMUMINUM COPING; FASTEN INSIDE FACE W/ SS SCREWS W/ NEOPRENE WASHERS, 24" O.C.; STRIP JOINTS W/ 5" WIDE RASM AND INSTALL 12" WIDE BACK-UP PLATES AND 6" WIDE COVER PLATES AT JOINTS
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13. SECURE PERIMETER FLASHING W/ SS RING SHANKED NAILS, 4" O.C., STAGGERED
14. SECURE MEMBRANE TO WALL FRAMING AT VERTICAL SUBSTRATE OR DECK ON HORIZONTAL, AS INDICATED ON DRAWINGS USING MFCT.'S REQUIRED SECUREMENT METHOD AND WITH MFCT.'S RECOMMENDED FASTENERS/PLATES
15. SECURE W/ ½" ø ANCHOR BOLTS SPACES 48" O.C. (24" O.C. WITHIN 10' OF CORNERS)
16. ¾" THICK PLYWOOD SHEATHING, SHIM AND FASTEN TO MASONRY; FASTEN IAW FASTENING SCHEDULE UNLESS OTHERWISE NOTED
17. WOOD BLOCKING/NAILER; PROVIDE SIZES SHOWN ON DRAWINGS; RIP TO FIT; SHIM OUTSIDE EDGE TO PROVIDE 1:12 SLOPE, MIN.; FASTEN W/ ½" ø ANCHOR BOLTS
18. TAPERED EDGE STRIP; USE AS REQUIRED TO PROVIDE SMOOTH TRANSITION
19. ALUMINUM TERMINATION BAR; FASTEN 6" O.C. W/ SCREWS/NAILS (WOOD) OR NAILINS (MASONRY/CONCRETE)
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21. CAREFULLY SAW CUT MORTAR, REMOVE AND SALVAGE (75% MIN.) 3-4 COURSES OF EXISTING BRICK MASONRY; FOLLOWING INSTALLATION OF FLASHINGS, REINSTALL MASONRY MATCHING BONDING/COURSING PATTERN OF EXISTING
22. 0.018" SS THROUGH-WALL FLASHING/RECEIVER; FASTEN W/ SS NAILINS, 24" O.C., STRIP JOINTS WITH 5" WIDE SHEET MEMBRANE AND INSTALL 6" WIDE COVER PLATE, FABRICATE HORIZONTAL FLANGE W/ SLOPE TOWARDS THE EXTERIOR, SET IN MORTAR; PROVIDE END DAMS
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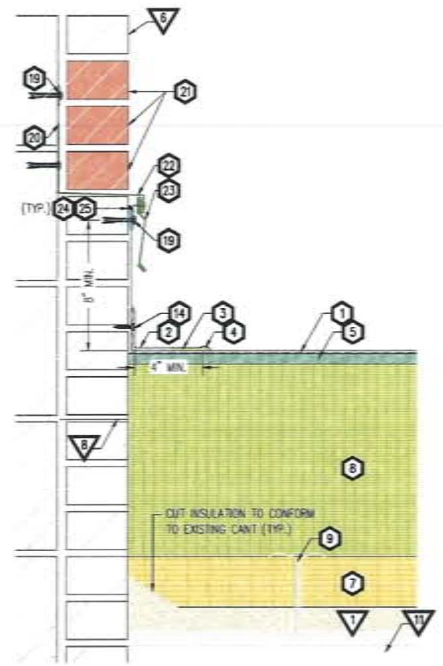
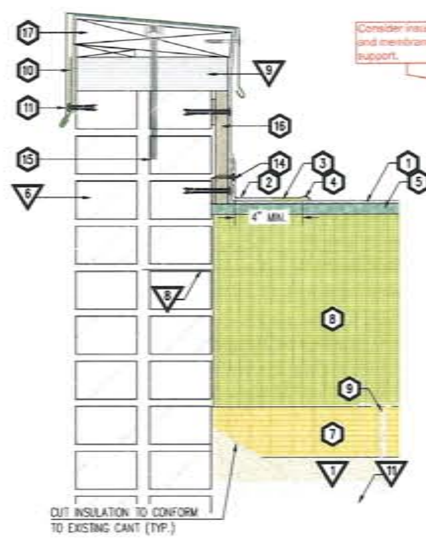
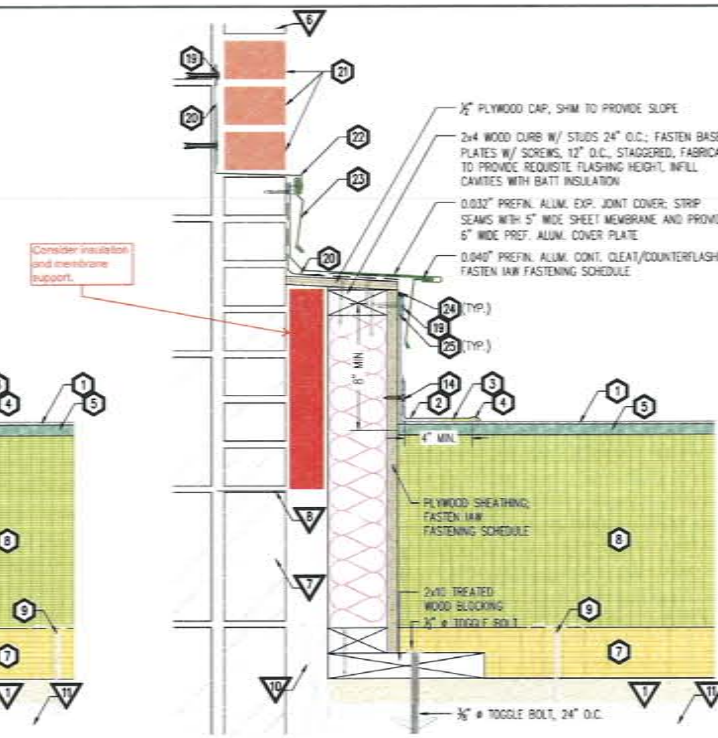


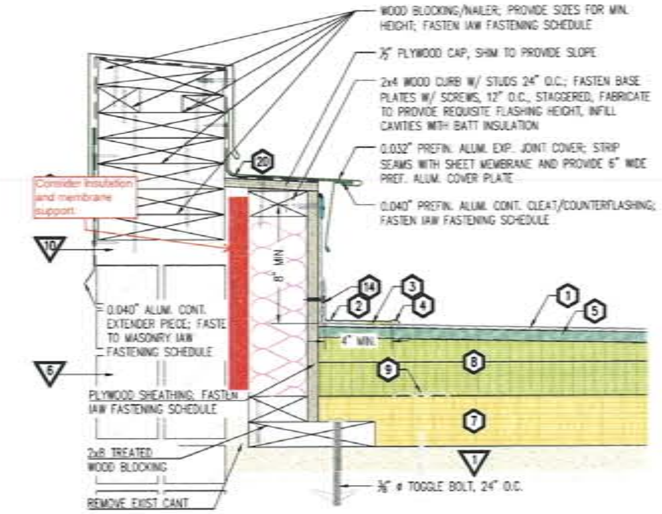
1 A5.2 K BASE FLASHING @ M1 & T MASONRY WALLS 3" = 1'-0"



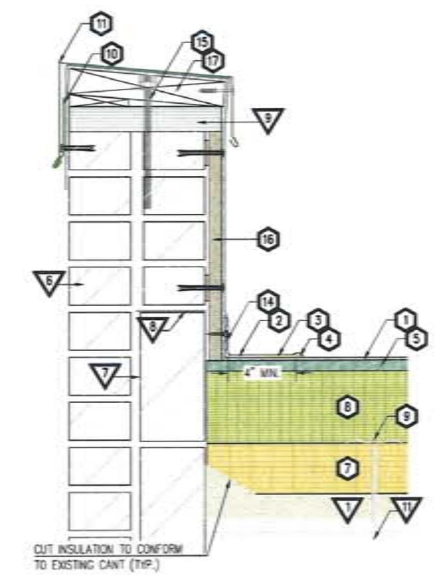
2 A5.2 PERIMETER PARAPET @ K 3" = 1'-0"



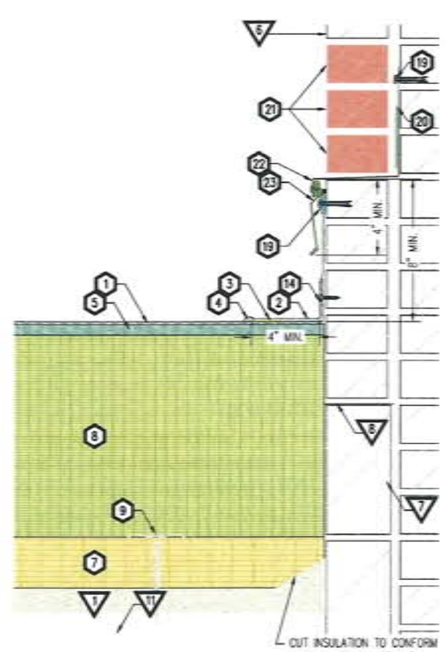
3 A5.2 EXPANSION JOINT DETAIL @ K @ H, I, AND J MASONRY WALLS; O @ E, N1, AND N2 MASONRY WALLS; T @ H MASONRY WALL 3" = 1'-0"



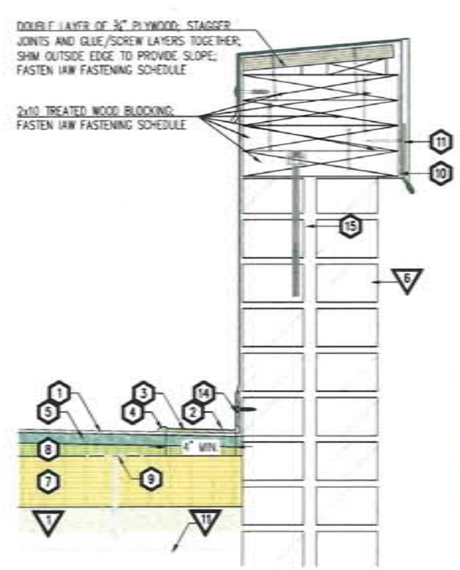
4 A5.2 M1 EXPANSION JOINT DETAIL @ EAST PARAPET 3" = 1'-0"



5 A5.2 NORTH & SOUTH PARAPET @ M1 3" = 1'-0"

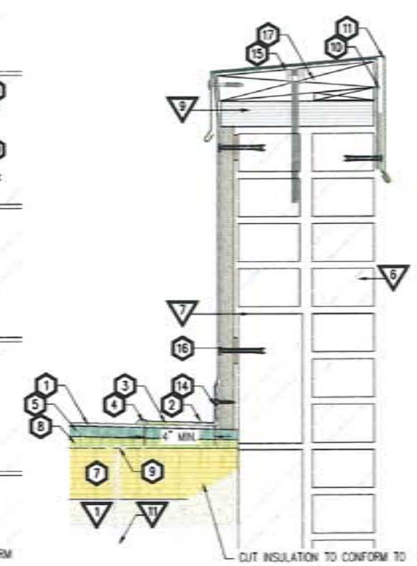


6 A5.2 M1 BASE FLASHING @ PERIMETER MASONRY WALL 3" = 1'-0"

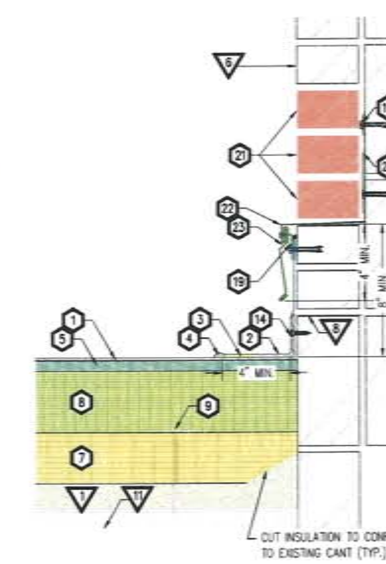


7 A5.2 PERIMETER PARAPET @ N2 3" = 1'-0"

8 A5.2 N2 BASE FLASHING @ MASONRY WALL 3" = 1'-0"



9 A5.2 PERIMETER PARAPET @ O 3" = 1'-0"



10 A5.2 O BASE FLASHING @ M1 MASONRY WALL 3" = 1'-0"

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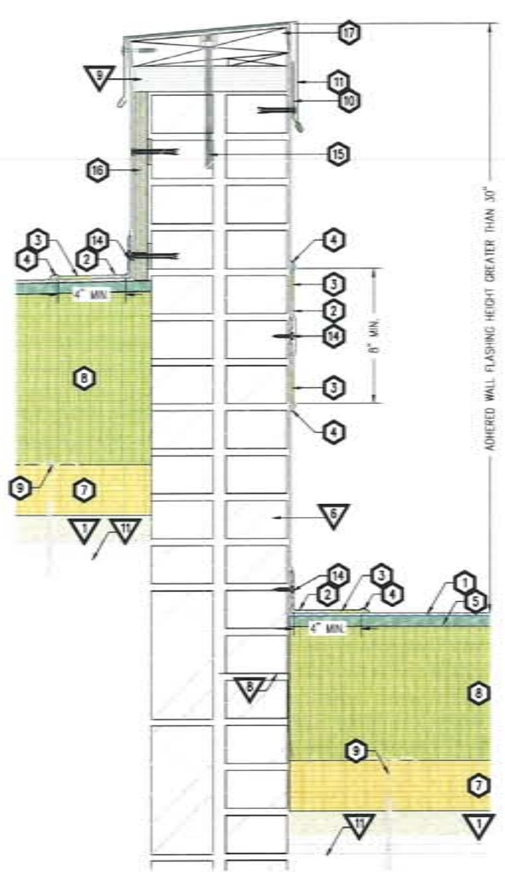
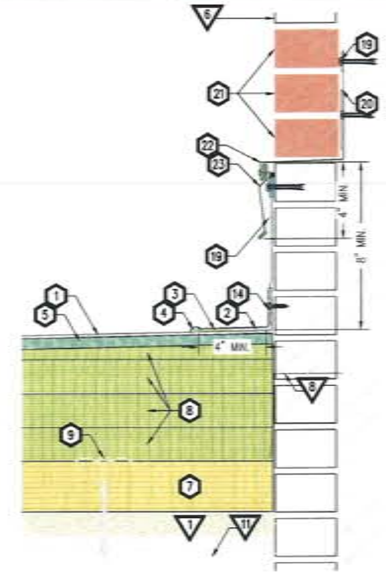
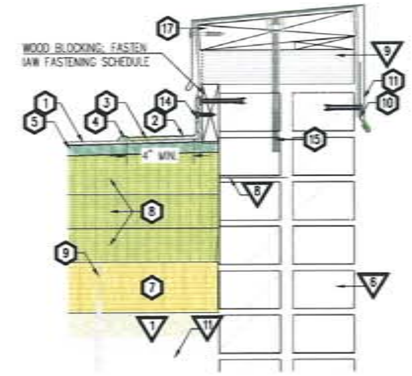


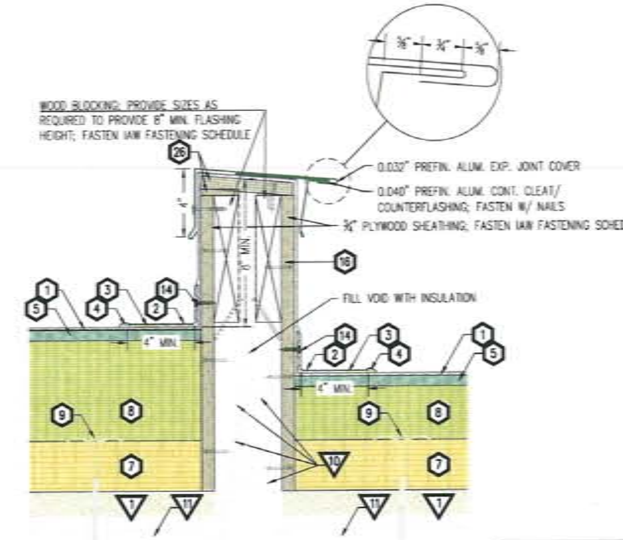
1 A5.3 PARAPET TRANSITION @ A TO P
3" = 1'-0"



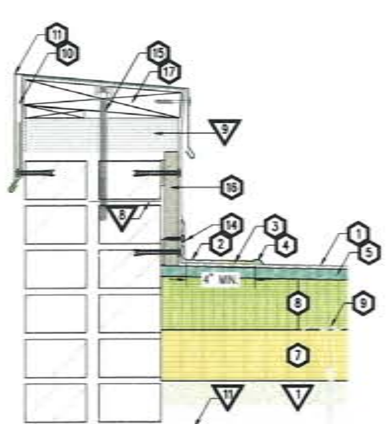
2 A5.3 BASE FLASHING (P) @ E MASONRY WALL
3" = 1'-0"



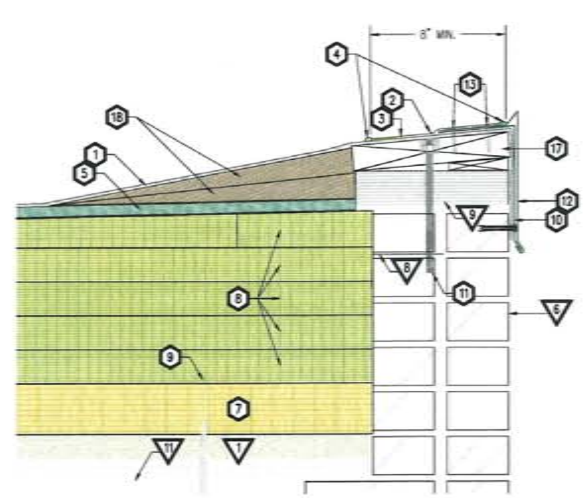
3 A5.3 PERIMETER PARAPET @ P
3" = 1'-0"



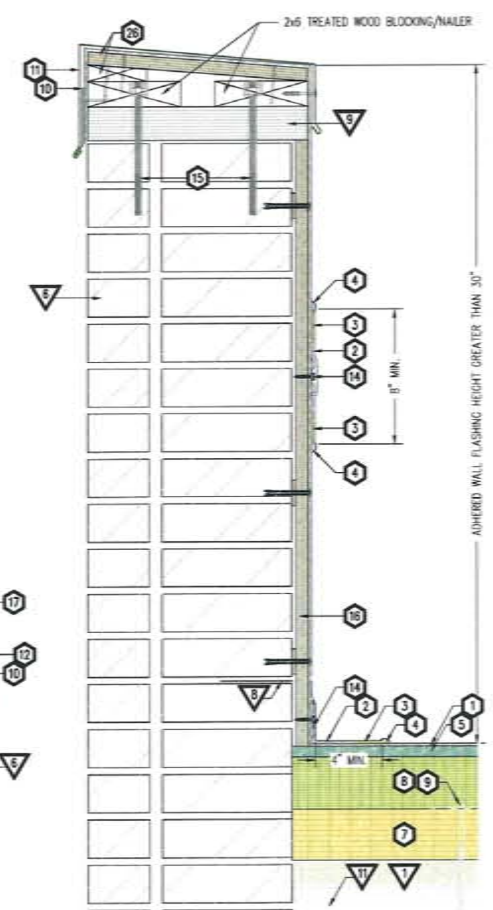
4 A5.3 EXPANSION JOINT @ P TO T
3" = 1'-0"



5 A5.3 PERIMETER PARAPET (SHORT) @ T
3" = 1'-0"



6 A5.3 GRAVEL STOP DETAIL @ T
3" = 1'-0"



7 A5.3 PERIMETER PARAPET (TALL) @ T
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8 A5.3 INTERIOR PARAPET @ T TO X
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12. 0.032" PREFINISHED ALUMINUM GRAVEL STOP; FASTEN W/ SS NAILS, 3" O.C., STAGGERED; SET FLANGE IN FULL BED OF SEALANT; PROVIDE 12" WIDE BACK-UP PLATES AND 6" WIDE COVER PLATES AT JOINTS
13. SECURE PERIMETER FLASHING W/ SS RING SHANKED NAILS, 4" O.C., STAGGERED
14. SECURE MEMBRANE TO WALL FRAMING AT VERTICAL SUBSTRATE OR DECK ON HORIZONTAL, AS INDICATED ON DRAWINGS USING MFCT.'S REQUIRED SECUREMENT METHOD AND WITH MFCT.'S RECOMMENDED FASTENERS/PLATES
15. SECURE W/ ½" ⌀ ANCHOR BOLTS SPACES 48" O.C. (24" O.C. WITHIN 10' OF CORNERS)
16. ¾" THICK PLYWOOD SHEATHING, SHIM AND FASTEN TO MASONRY; FASTEN IAW FASTENING SCHEDULE UNLESS OTHERWISE NOTED
17. WOOD BLOCKING/NAILER; PROVIDE SIZES SHOWN ON DRAWINGS; RIP TO FIT; SHIM OUTSIDE EDGE TO PROVIDE 1:12 SLOPE, MIN.; FASTEN W/ ½" ⌀ ANCHOR BOLTS
18. TAPERED EDGE STRIP; USE AS REQUIRED TO PROVIDE SMOOTH TRANSITION
19. ALUMINUM TERMINATION BAR; FASTEN 6" O.C. W/ SCREWS/NAILS (WOOD) OR NAILINS (MASONRY/CONCRETE)
20. SELF-ADHERING SHEET MEMBRANE UNDERLAYMENT/ FLASHING; PRIME SUBSTRATES PRIOR TO APPLICATION
21. CAREFULLY SAW CUT MORTAR, REMOVE AND SALVAGE (75% MIN.) 3-4 COURSES OF EXISTING BRICK MASONRY; FOLLOWING INSTALLATION OF FLASHINGS, REINSTALL MASONRY MATCHING BONDING/COURSING PATTERN OF EXISTING
22. 0.018" SS THROUGH-WALL FLASHING/RECEIVER; FASTEN W/ SS NAILINS, 24" O.C., STRIP JOINTS WITH 5" WIDE SHEET MEMBRANE AND INSTALL 6" WIDE COVER PLATE, FABRICATE HORIZONTAL FLANGE W/ SLOPE TOWARDS THE EXTERIOR, SET IN MORTAR; PROVIDE END DAMS
23. 0.032" PREFINISHED ALUMINUM COUNTERFLASHING; FASTEN 16" O.C. W/ SS SCREWS W/ NEOPRENE WASHERS
24. SEALANT
25. WATER BLOCK
26. ¾" TREATED PLYWOOD CAP; SHIM TO PROVIDE 1:12 SLOPE, MIN.; FASTEN S/ NAILS, 8" O.C.

EXISTING CONSTRUCTION

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8. EXIST. THROUGH-WALL FLASHING; CUT FLUSH W/ FACE OF MASONRY
9. EXIST. STONE COPING
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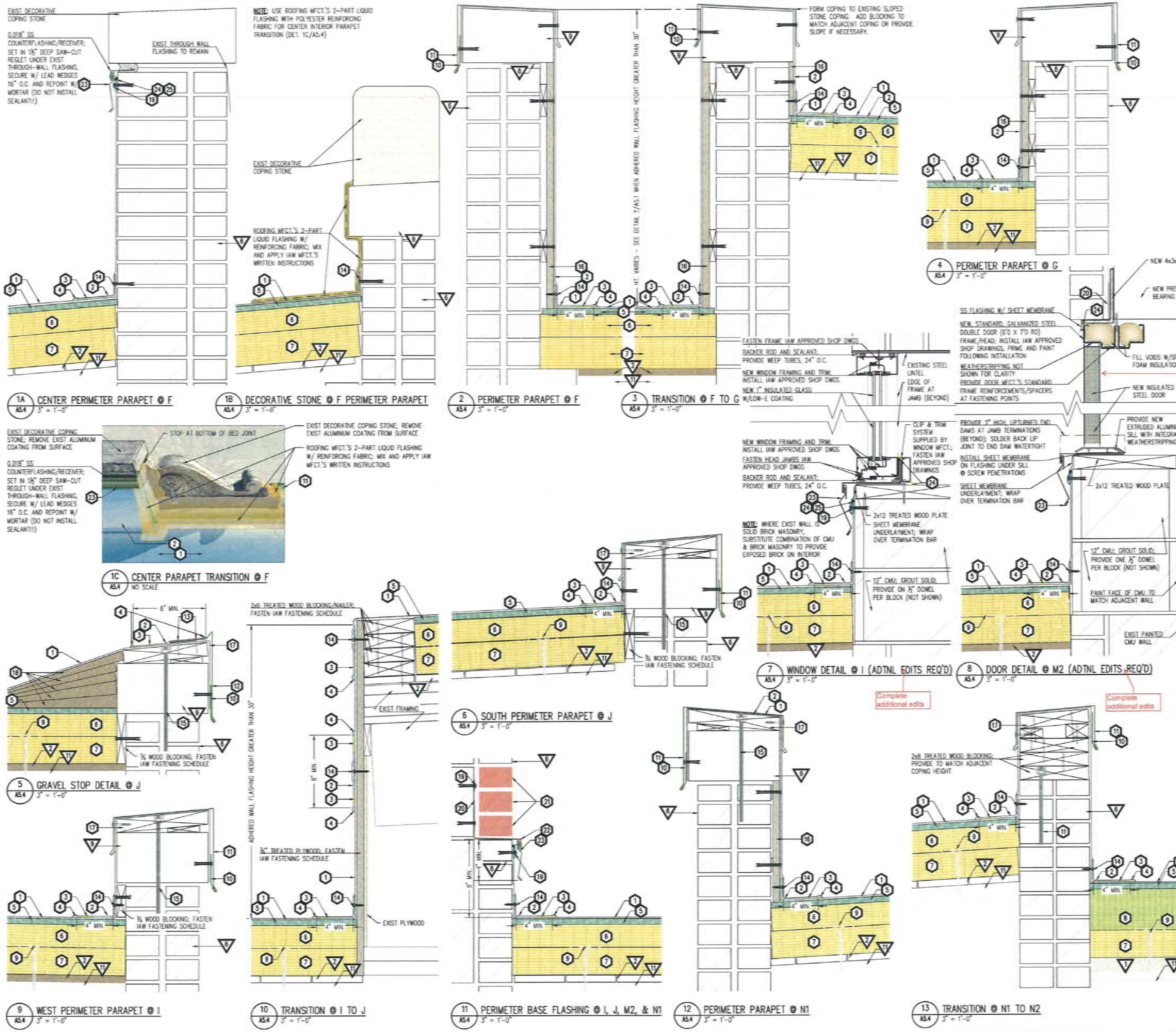

#	DATE	SUBMISSIONS/REVISIONS

ROOF REPLACEMENT
MOUNT VERNON COMMUNITY SCHOOL
ALEXANDRIA CITY PUBLIC SCHOOLS
2601 COMMONWEALTH AVENUE
ALEXANDRIA, VIRGINIA 22305

RESTORATION ENGINEERING, INC.

ROOF DETAILS
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A-5.4

10 OF 16

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6. 2½" THICK POLYISOCYANURATE INSULATION; SET IN MFCT.'S RECOMMENDED POLYURETHANE ADHESIVE INSTALLED IAW MFCT.'S APPROVED COVERAGE/PATTERN; INSTALL IAW APPROVED SHOP DRAWINGS
7. 3" THICK BASE LAYER POLYISOCYANURATE INSULATION; FASTEN IAW APPROVED SHOP DRAWINGS
8. TAPERED POLYISOCYANURATE INSULATION; SLOPES AND CONFIGURATIONS VARY (SEE ROOF PLAN); SET IN MFCT.'S RECOMMENDED POLYURETHANE ADHESIVE INSTALLED IAW MFCT.'S APPROVED COVERAGE/PATTERN; INSTALL IAW APPROVED SHOP DRAWINGS
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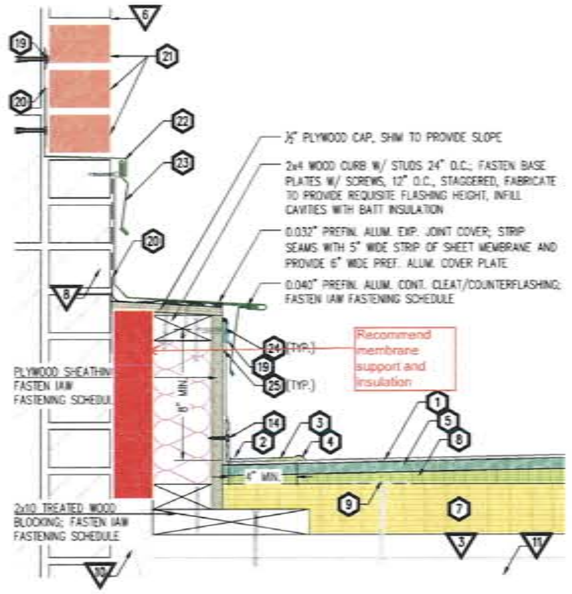
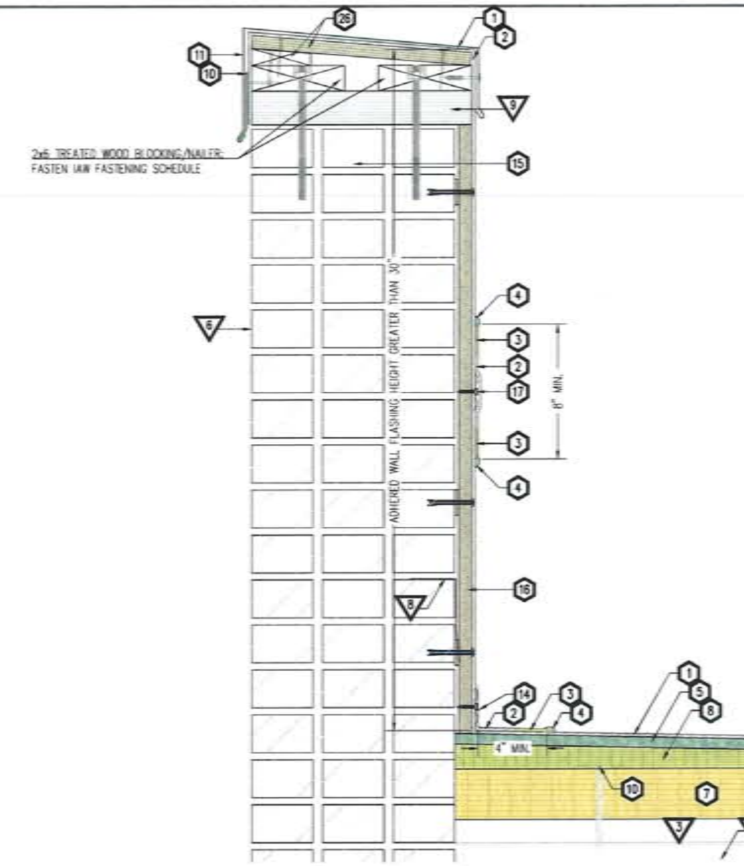
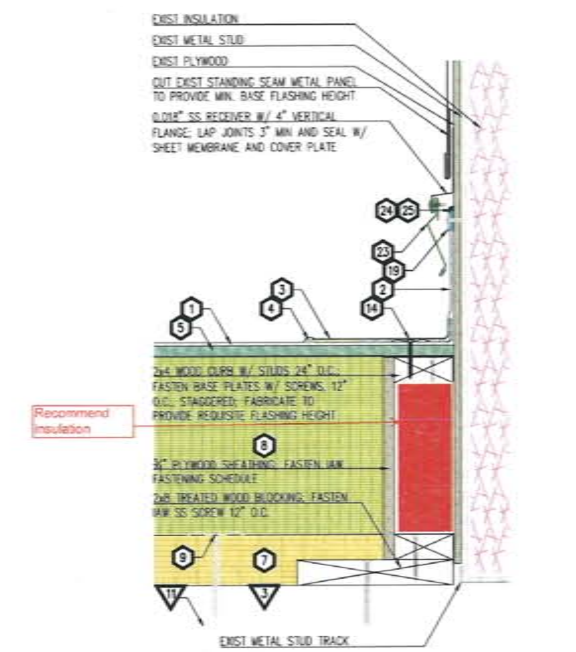


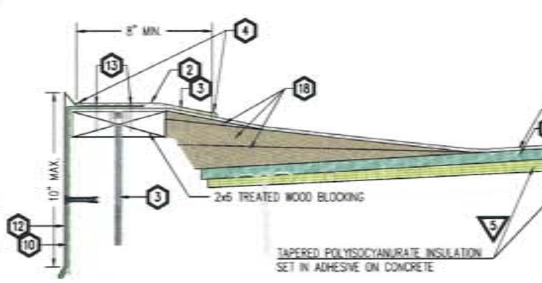
1 / A5.5 X EXPANSION JOINT @ H MASONRY WALL 3" = 1'-0"



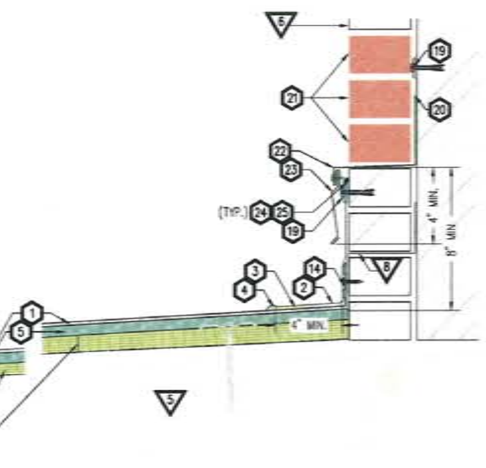
2 / A5.5 PERIMETER PARAPET @ X 3" = 1'-0"



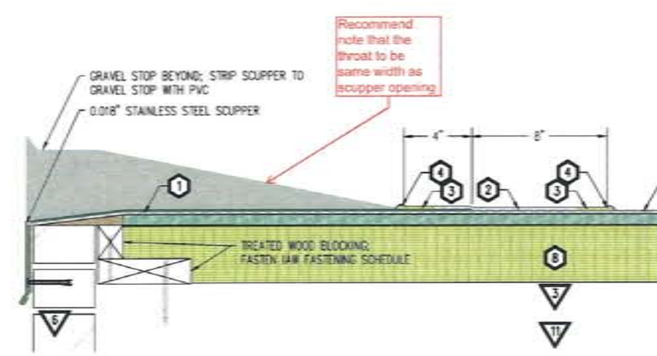
3 / A5.5 TRANSITION @ X TO Y 3" = 1'-0"



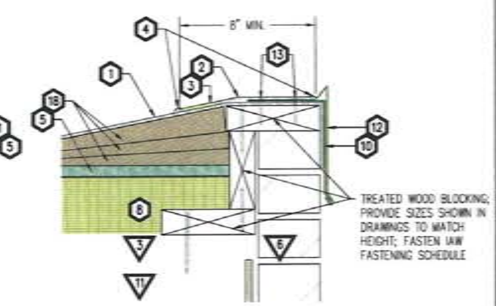
4 / A5.5 GRAVEL STOP DETAIL @ E1 (TYP. @ B1, G1, & L) 3" = 1'-0"



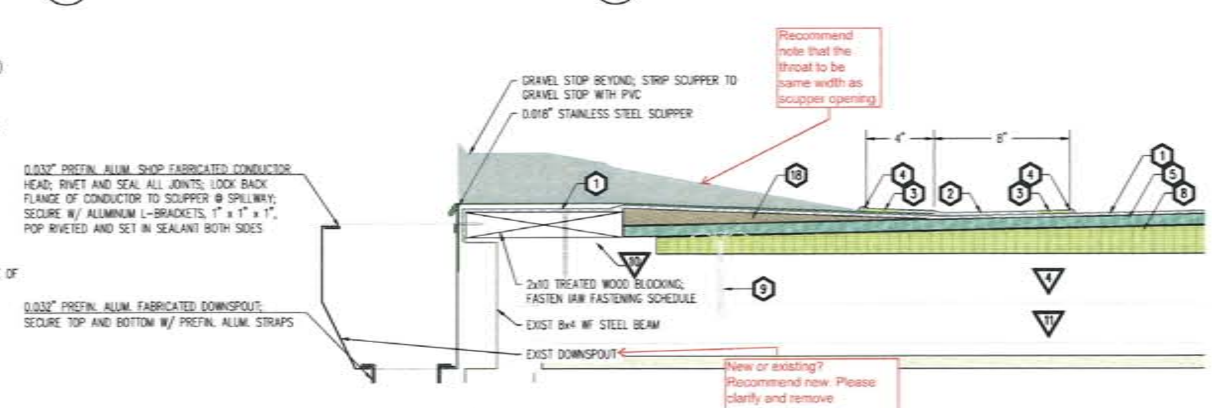
5 / A5.5 BASE FLASHING DETAIL @ E1 (TYP. @ B1, G1, & L) 3" = 1'-0"



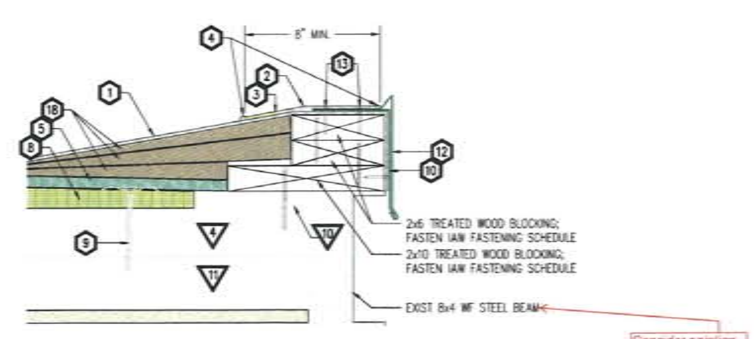
6 / A5.5 SCUPPER DETAIL @ R 3" = 1'-0"



7 / A5.5 GRAVEL STOP DETAIL @ R 3" = 1'-0"



8 / A5.5 SCUPPER DETAIL @ Q 3" = 1'-0"



9 / A5.5 GRAVEL STOP DETAIL @ Q 3" = 1'-0"

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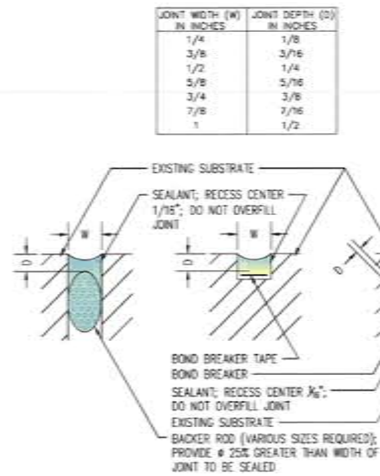
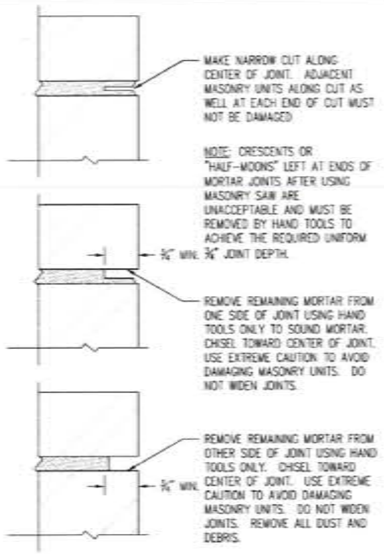
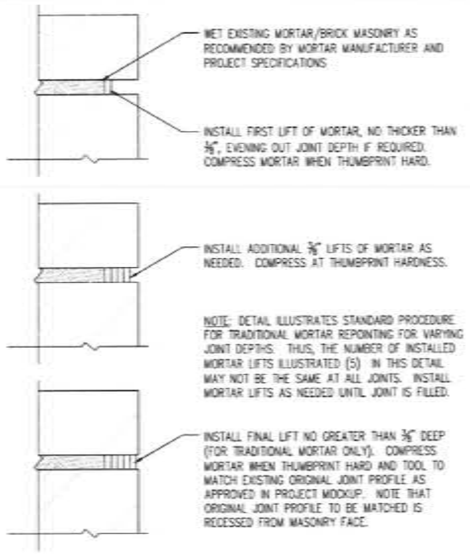
JOINT WIDTH (W) IN INCHES	JOINT DEPTH (D) IN INCHES
1/4	1/8
3/8	3/16
1/2	1/4
5/8	5/16
3/4	3/8
7/8	7/16
1	1/2



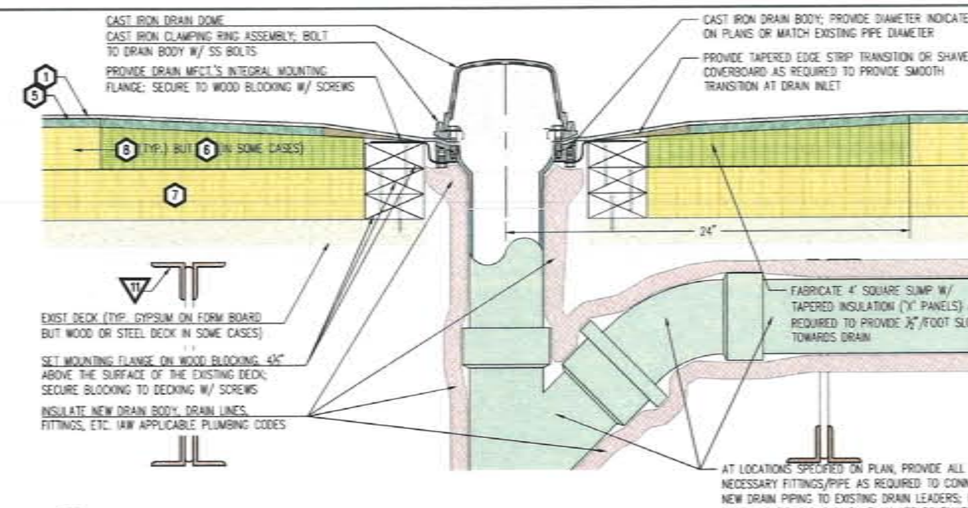
1 A5.6 SEALANT INSTALLATION GUIDELINES
NO SCALE



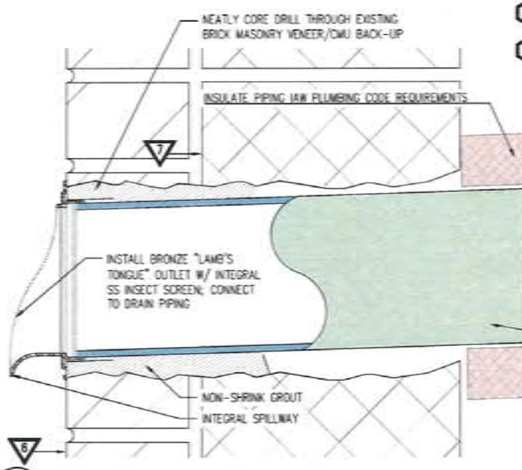
2A A5.6 MASONRY REPOINTING (MORTAR REMOVAL)
3" = 1'-0"



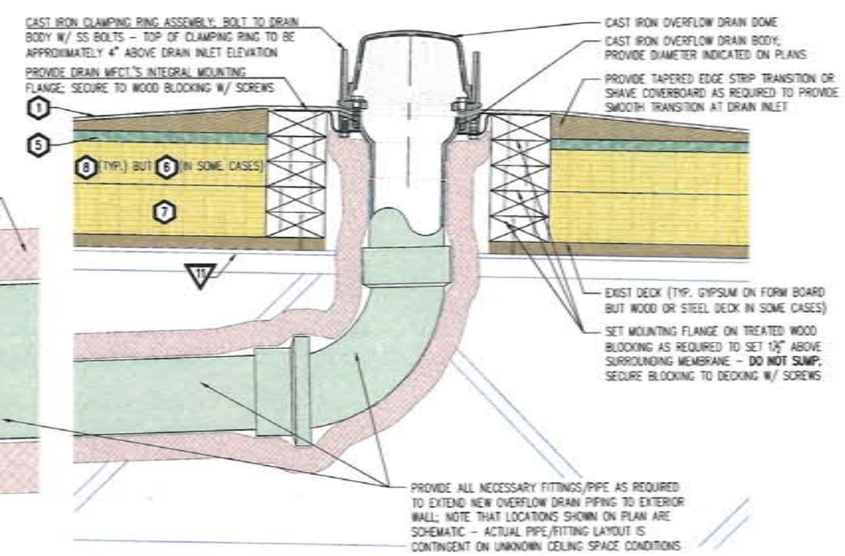
2A A5.6 MASONRY REPOINTING (TRADITIONAL MORTAR INSTALL)
3" = 1'-0"



3 A5.6 TYPICAL ROOF DRAIN DETAIL
3" = 1'-0"



4 A5.6 TYPICAL OVERFLOW DRAINLINE OUTLET DETAIL
HALF SIZE



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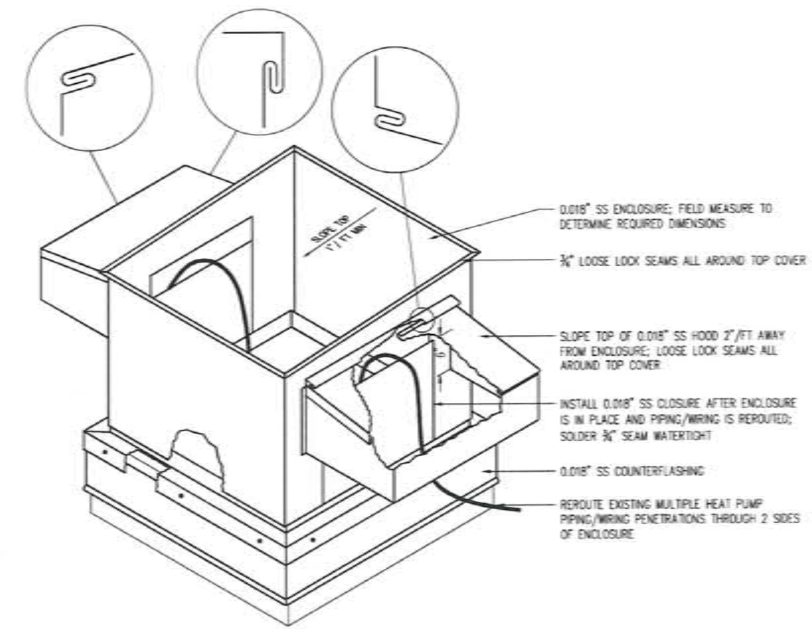
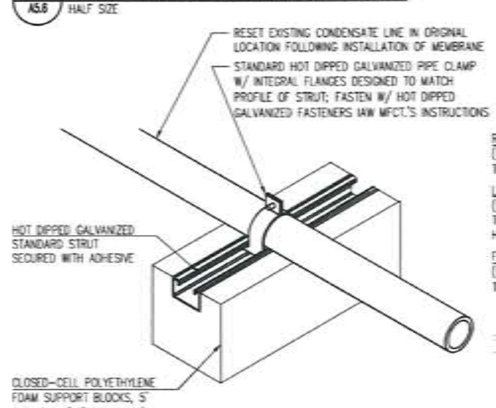
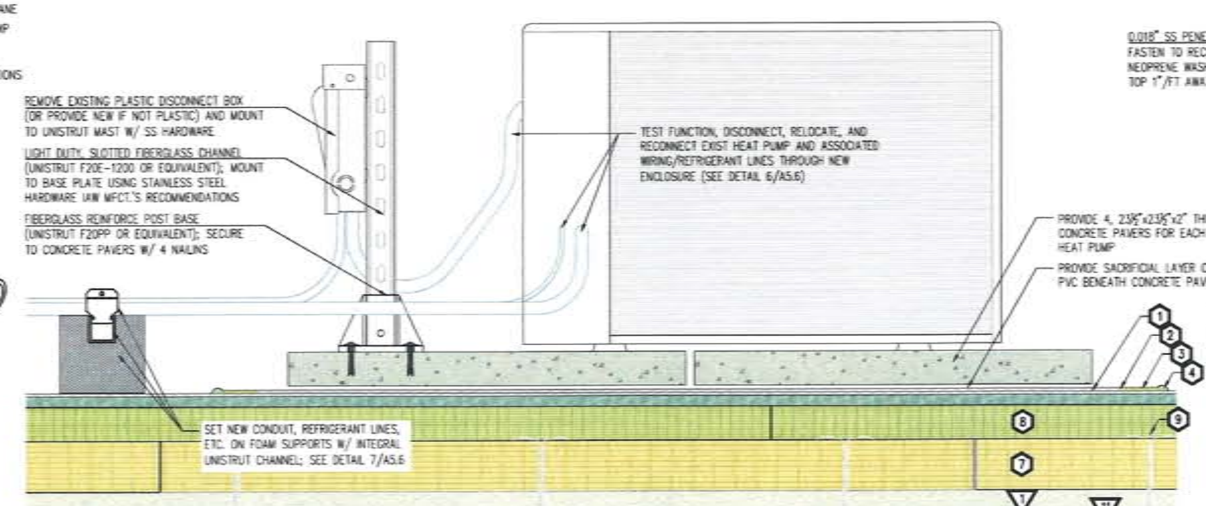


6A A5.6 MULTIPLE CONDUIT ENCLOSURE DETAIL
3" = 1'-0"



7 A5.6 CONDENSATE SUPPORT DETAIL
3" = 1'-0"



8 A5.6 HEAT PUMP/ELECTRICAL SHUTOFF DETAIL
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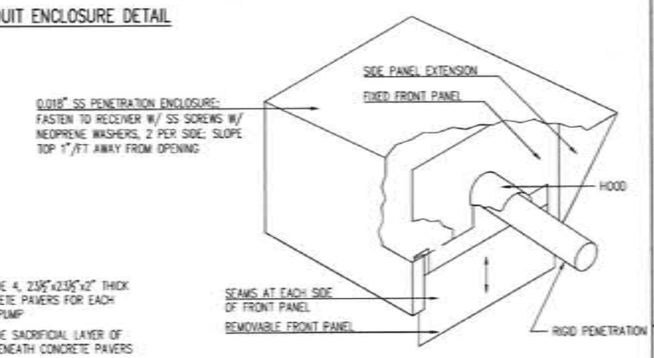

6B A5.6 RIGID PENETRATION ENCLOSURE DETAIL
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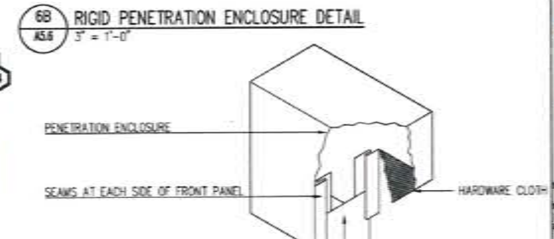

6C A5.6 FLEXIBLE PENETRATION ENCLOSURE DETAIL
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14. SECURE MEMBRANE TO WALL FRAMING AT VERTICAL SUBSTRATE OR DECK ON HORIZONTAL, AS INDICATED ON DRAWINGS USING MFCT.'S REQUIRED SECUREMENT METHOD AND WITH MFCT.'S RECOMMENDED FASTENERS/PLATES
15. SECURE W/ ½" ⌀ ANCHOR BOLTS SPACES 48" O.C. (24" O.C. WITHIN 10' OF CORNERS)
16. ¾" THICK PLYWOOD SHEATHING, SHIM AND FASTEN TO MASONRY; FASTEN IAW FASTENING SCHEDULE UNLESS OTHERWISE NOTED
17. WOOD BLOCKING/NAILER; PROVIDE SIZES SHOWN ON DRAWINGS; RIP TO FIT; SHIM OUTSIDE EDGE TO PROVIDE 1:12 SLOPE, MIN.; FASTEN W/ ½" ⌀ ANCHOR BOLTS
18. TAPERED EDGE STRIP; USE AS REQUIRED TO PROVIDE SMOOTH TRANSITION
19. ALUMINUM TERMINATION BAR; FASTEN 6" O.C. W/ SCREWS/NAILS (WOOD) OR NAILNS (MASONRY/CONCRETE)
20. SELF-ADHERING SHEET MEMBRANE UNDERLAYMENT/ FLASHING; PRIME SUBSTRATES PRIOR TO APPLICATION
21. CAREFULLY SAW CUT MORTAR; REMOVE AND SALVAGE (75% MIN.) 3-4 COURSES OF EXISTING BRICK MASONRY; FOLLOWING INSTALLATION OF FLASHINGS, REINSTALL MASONRY MATCHING BONDING/COURSING PATTERN OF EXISTING
22. 0.018" SS THROUGH-WALL FLASHING/RECEIVER; FASTEN W/ SS NAILNS, 24" O.C., STRIP JOINTS WITH 5" WIDE SHEET MEMBRANE AND INSTALL 6" WIDE COVER PLATE, FABRICATE HORIZONTAL FLANGE W/ SLOPE TOWARDS THE EXTERIOR, SET IN MORTAR; PROVIDE END DAMS
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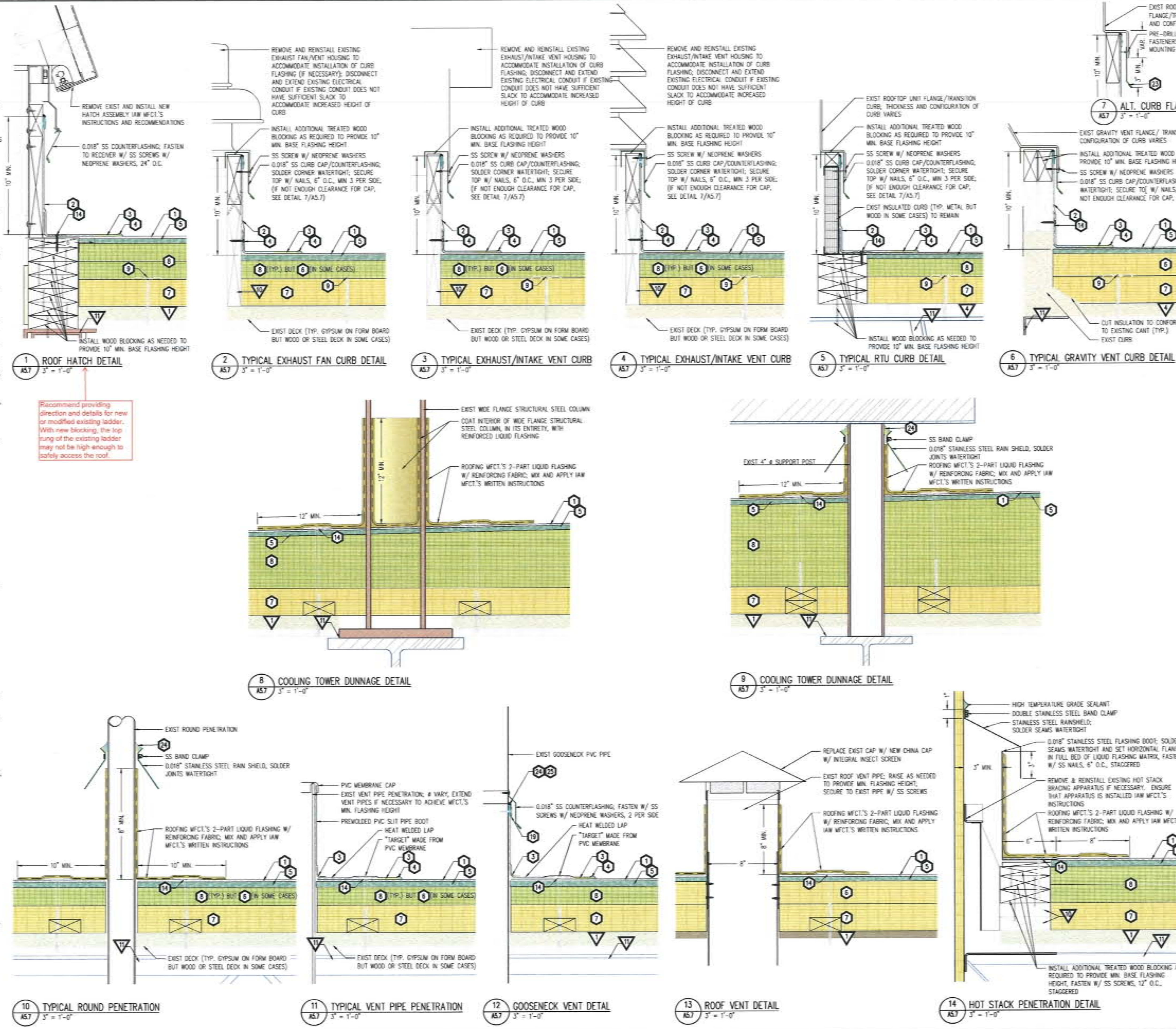

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ROOF REPLACEMENT
MOUNT VERNON COMMUNITY SCHOOL
ALEXANDRIA CITY PUBLIC SCHOOLS
2601 COMMONWEALTH AVENUE
ALEXANDRIA, VIRGINIA 22305

RESTORATION ENGINEERING, INC.

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A-5.7

13 OF 16

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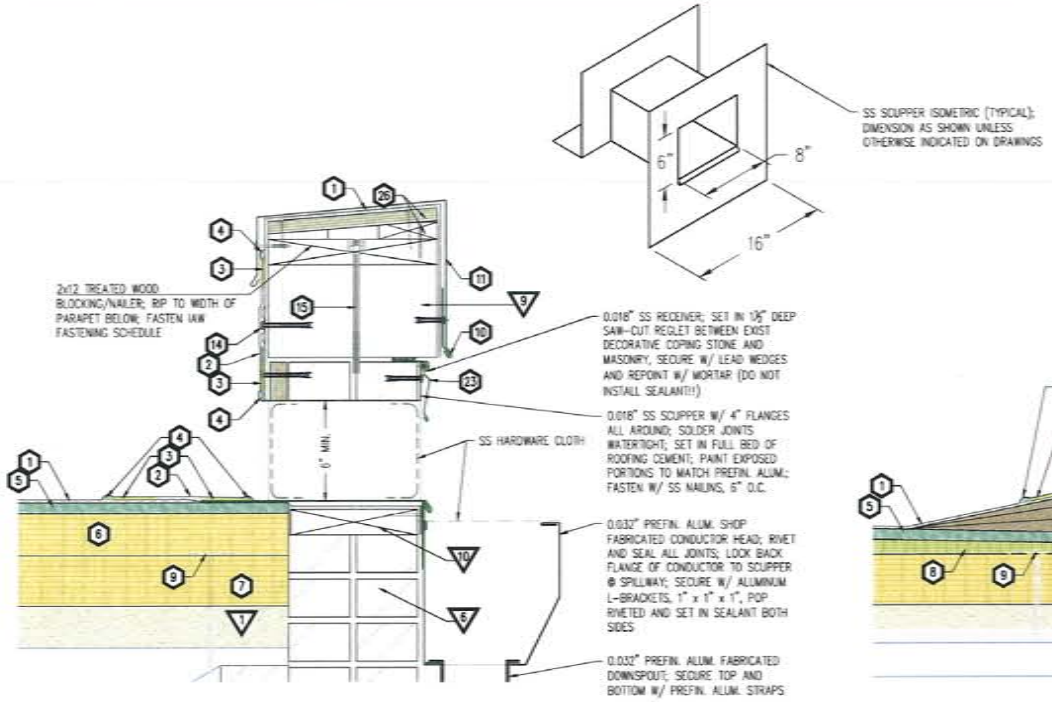
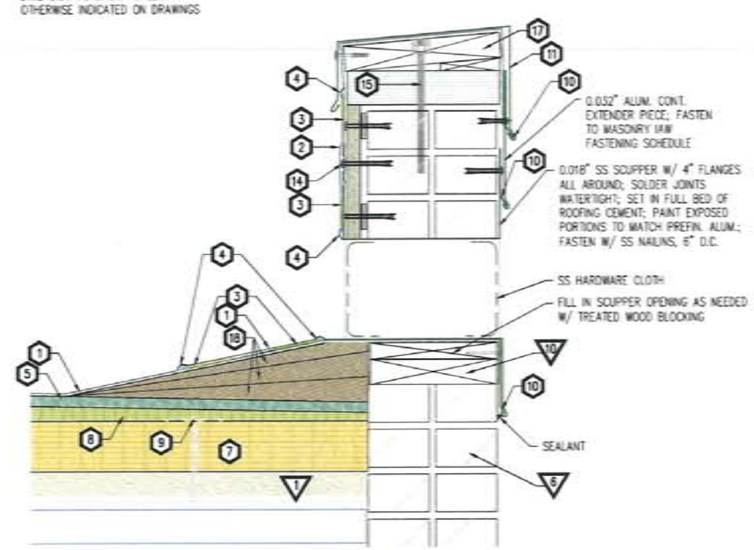
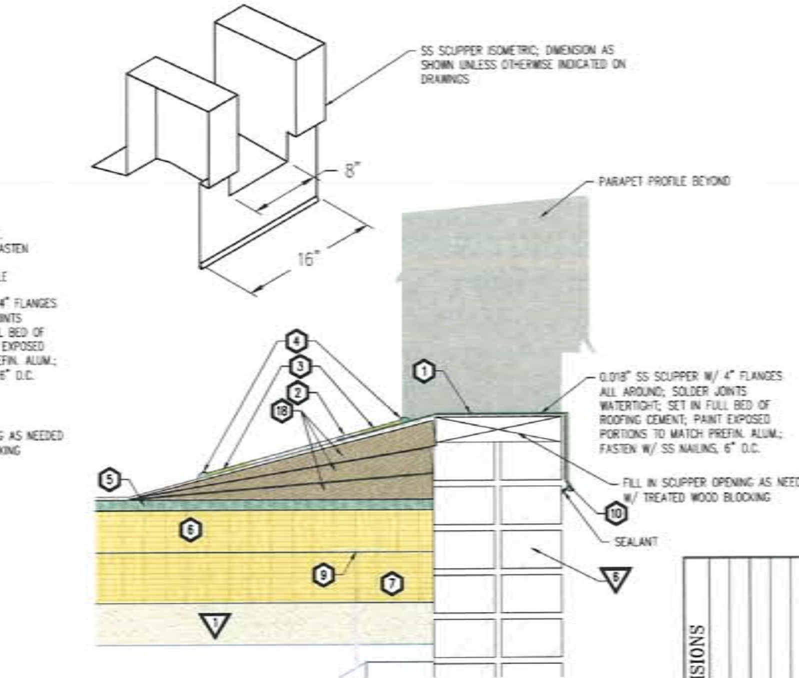


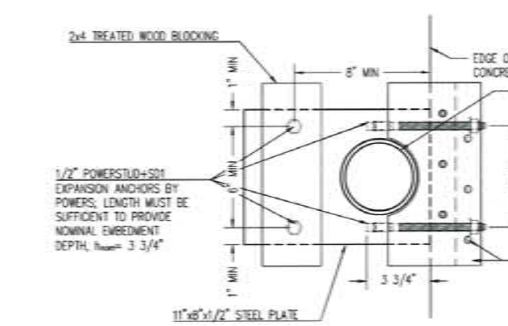
1 A5.8 TYPICAL SCUPPER DETAIL 3" = 1'-0"



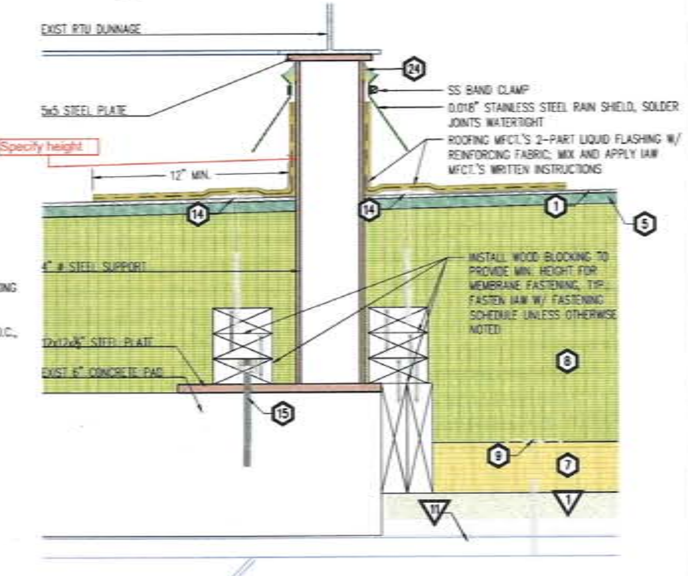
2 A5.8 TYPICAL OVERFLOW SCUPPER DETAIL 3" = 1'-0"



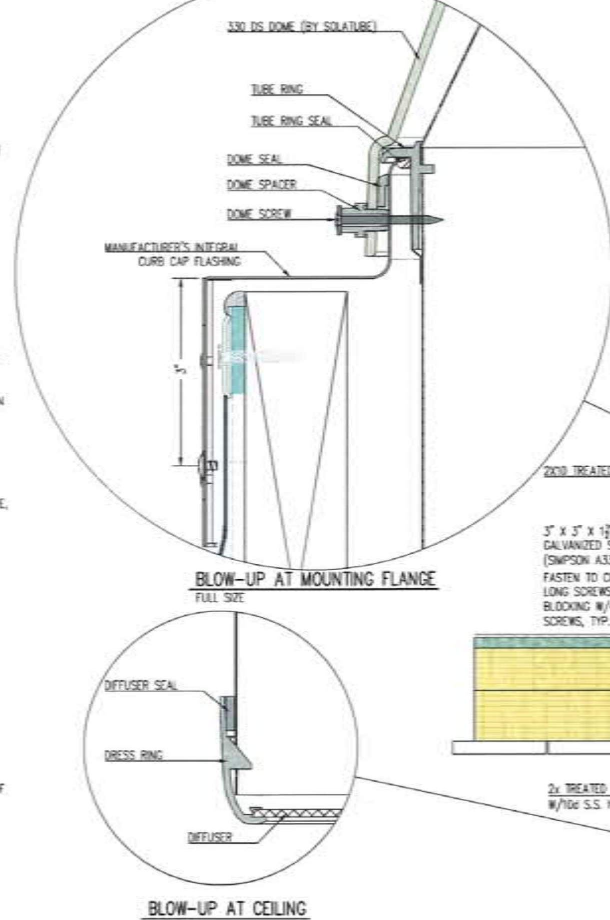
3 A5.8 OVERFLOW SCUPPER DETAIL W/ LOW PARAPET HEIGHT 3" = 1'-0"



5A A5.8 BASE PLATE PLAN DETAIL 3" = 1'-0"

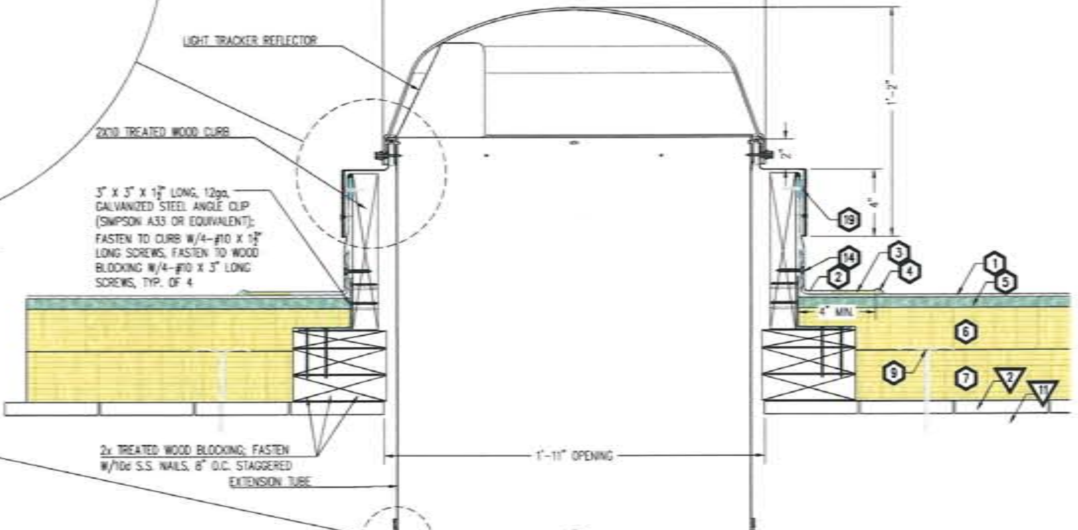


5 A5.8 RTU SUPPORT DETAIL @ A 3" = 1'-0"

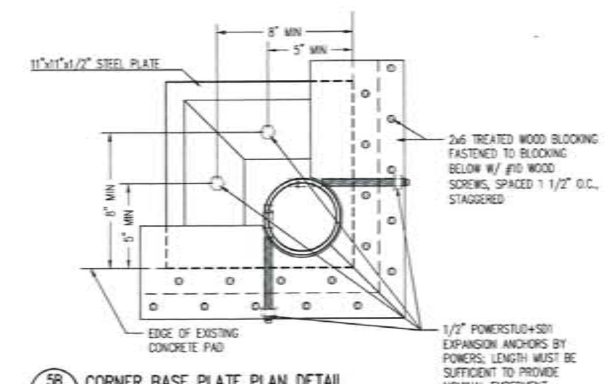


BLOW-UP AT MOUNTING FLANGE
FULL SIZE

BLOW-UP AT CEILING
FULL SIZE



4 A5.8 SKYLIGHT DETAIL 3" = 1'-0"



5B A5.8 CORNER BASE PLATE PLAN DETAIL 3" = 1'-0"

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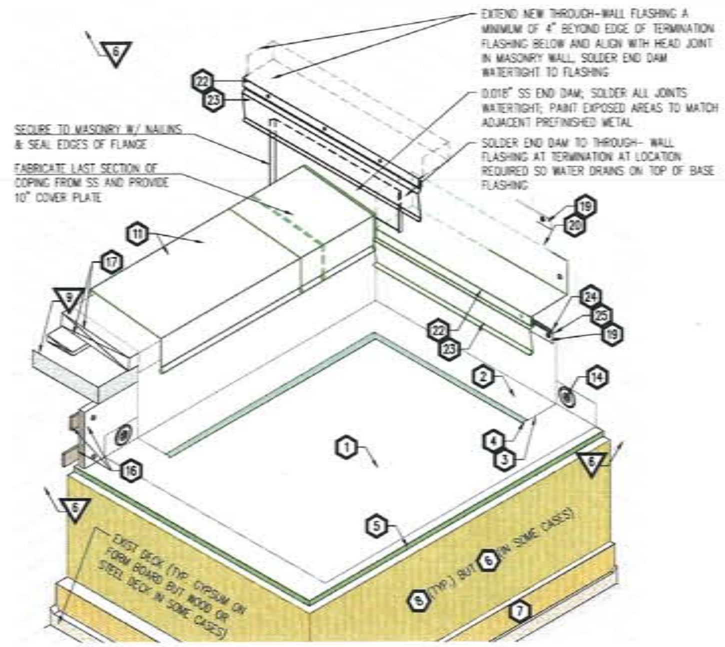
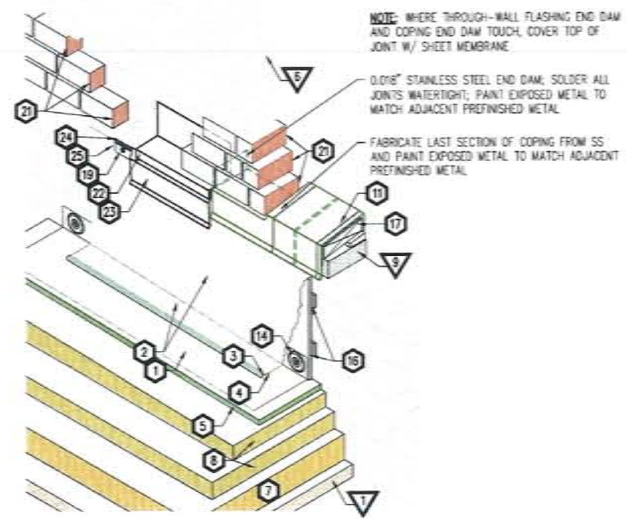
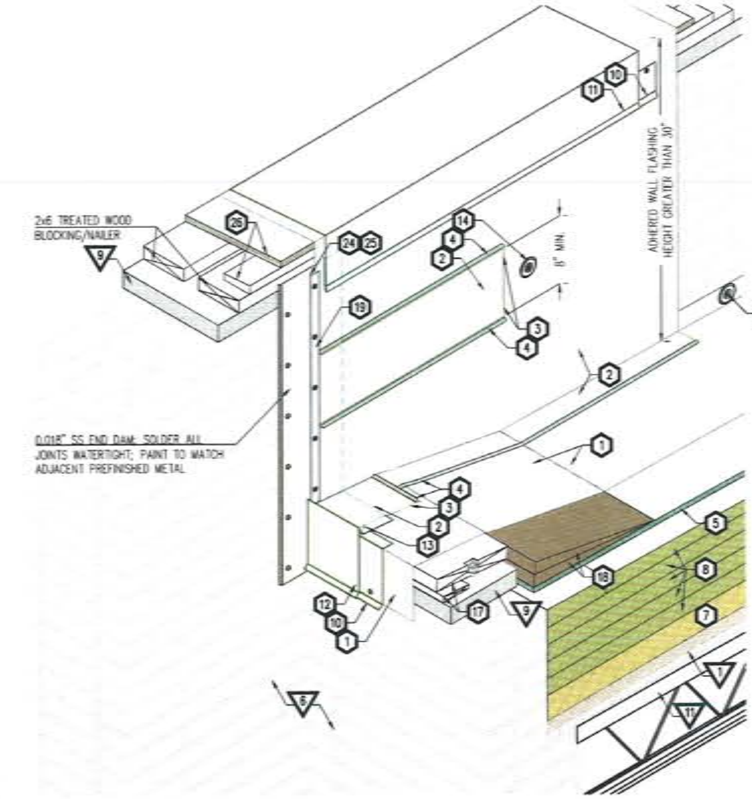


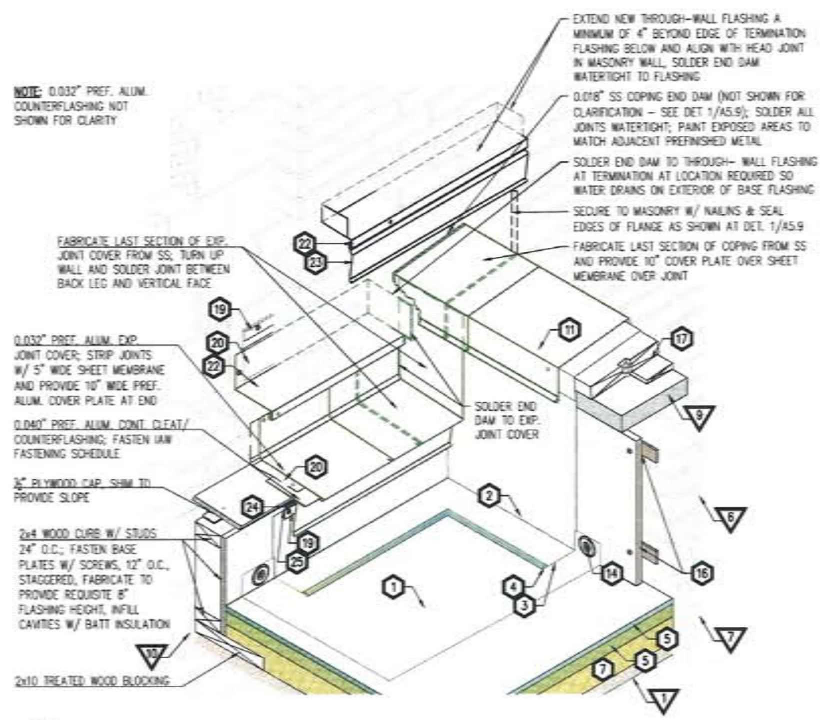
1 / A5.9 COPING TERMINATION AT MASONRY WALL
NO SCALE



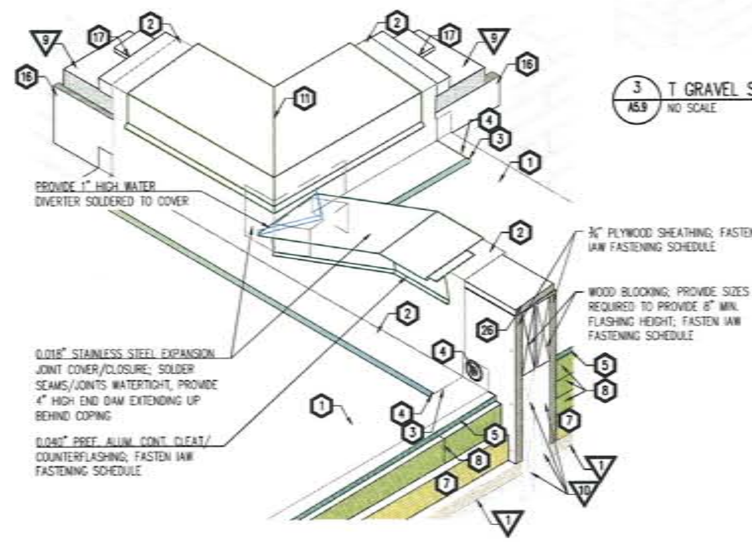
2 / A5.9 M1 THROUGH-WALL FLASHING TO COPING TRANSITION AT MASONRY WALL
NO SCALE



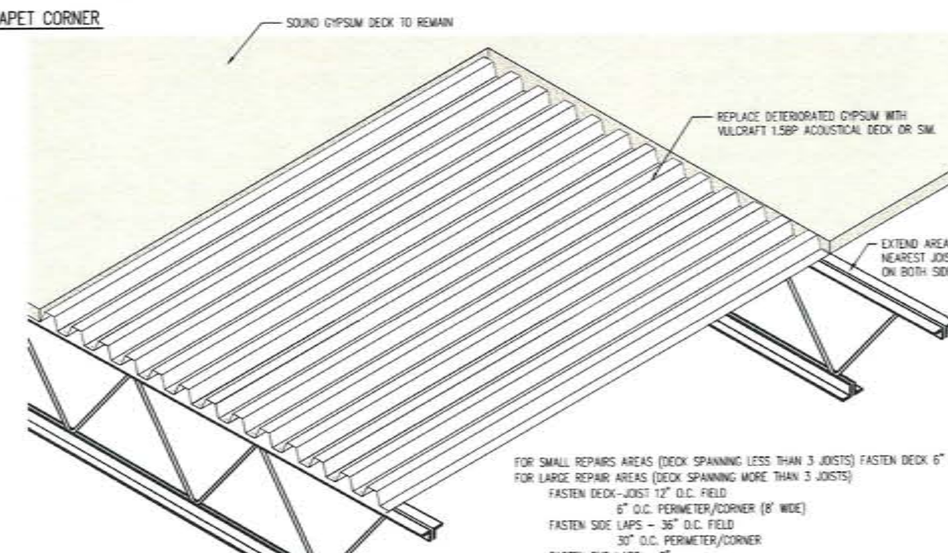
3 / A5.9 T GRAVEL STOP TERMINATION AT X
NO SCALE



4 / A5.9 COPING TERMINATION AT MASONRY WALL
NO SCALE



5 / A5.9 EXPANSION JOINT TERMINATION AT PARAPET CORNER
NO SCALE



FOR SMALL REPAIRS AREAS (DECK SPANNING LESS THAN 3 JOISTS) FASTEN DECK 6" O.C.
FOR LARGE REPAIR AREAS (DECK SPANNING MORE THAN 3 JOISTS)
FASTEN DECK-JOIST 12" O.C. FIELD
6" O.C. PERIMETER/CORNER (8' WIDE)
FASTEN SIDE LAPS – 36" O.C. FIELD
30" O.C. PERIMETER/CORNER
FASTEN END LAPS – 2"

6 / A5.9 TYPICAL DECK REPAIR DETAIL
NO SCALE

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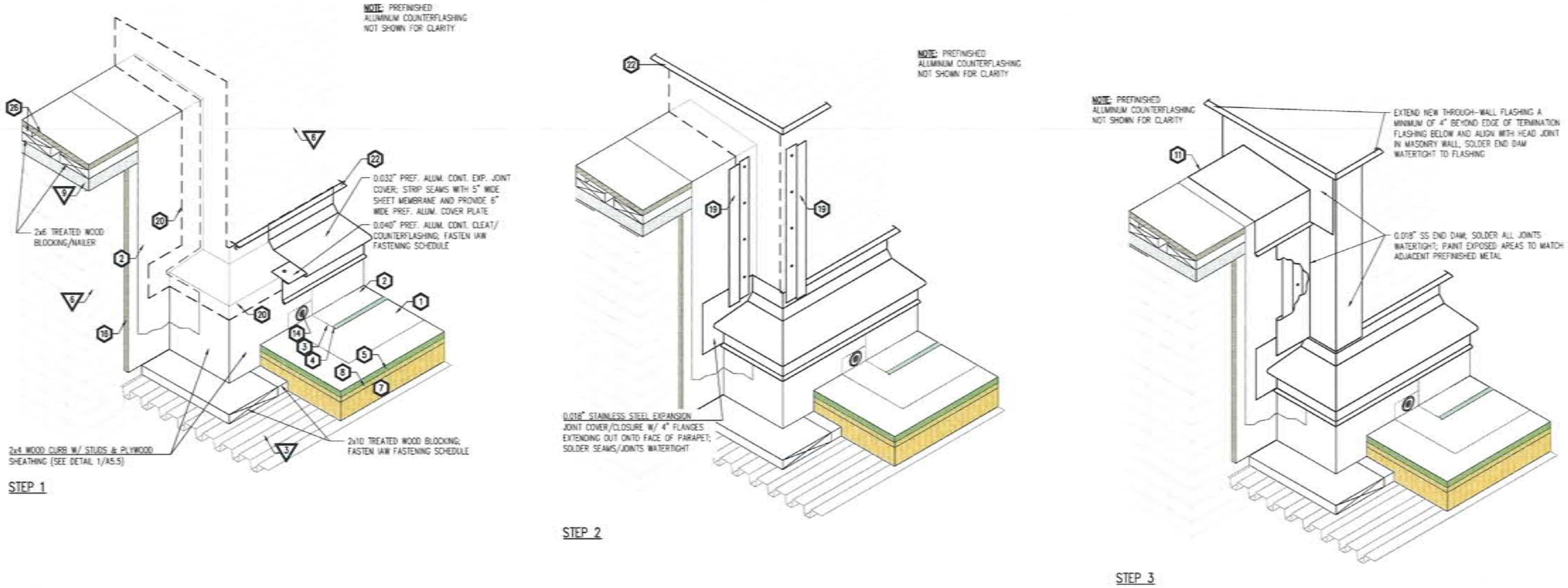
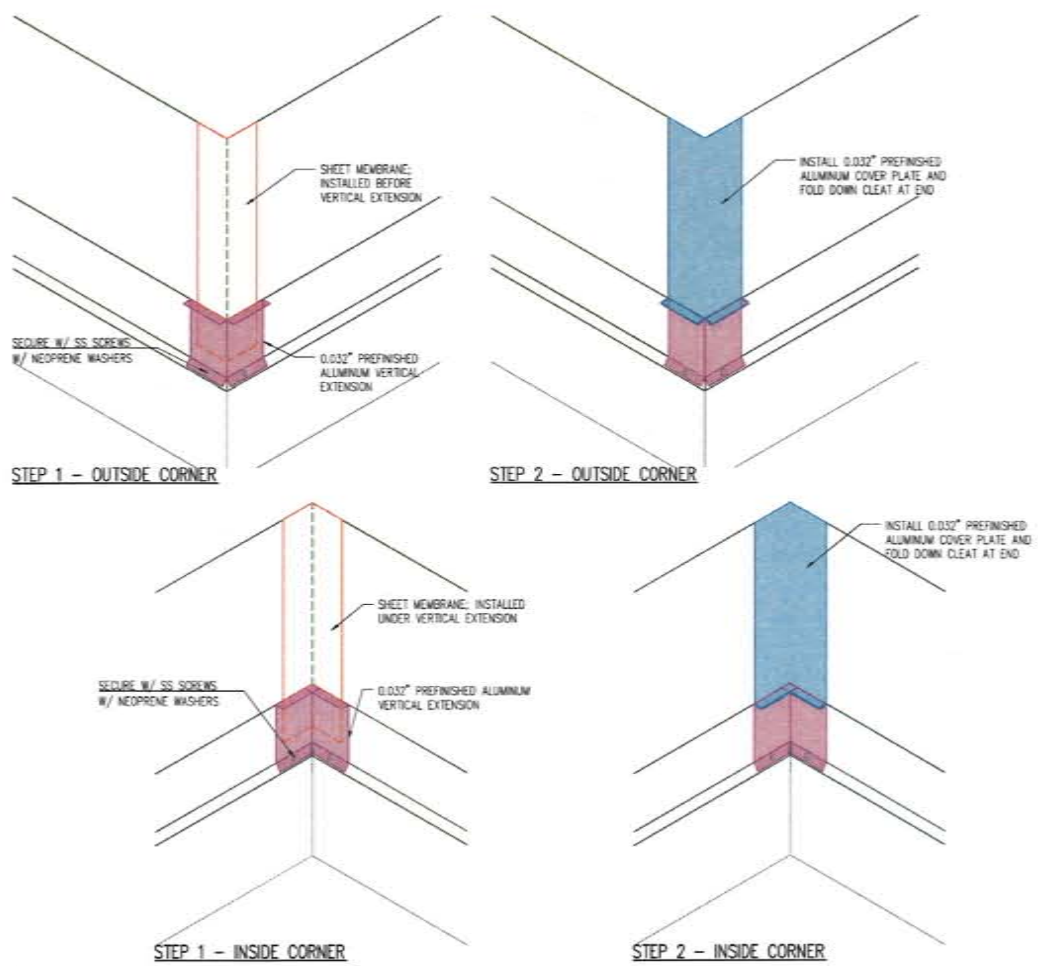
10. EXIST. WOOD BLOCKING TO REMAIN
11. EXIST. STEEL FRAMING/JOISTS



1/A5.10 X EXPANSION JOINT TERMINATION AT MASONRY WALL TO PARAPET TRANSITION
NO SCALE



2/A5.10 COPING CORNER JOINT DETAIL
NO SCALE

FASTENER SCHEDULE

FASTEN COMPONENTS IN ACCORDANCE WITH THE FOLLOWING FASTENER SCHEDULE, DRAWINGS AND SPECIFICATIONS, WHICHEVER IS MOST STRINGENT. SPECIAL CARE MUST BE TAKEN AT BUILDING CORNERS WHERE FASTENER SPACING IS REDUCED (NUMBER OF FASTENERS ARE INCREASED).

ELEMENT		SUBSTRATE	FASTENER	CONNECTION TYPE	SPACING
WOOD NAILER/BLOCKING (HORIZONTAL)	to	MASONRY/CONCRETE	1/2"Ø SS ANCHOR BOLTS	PRE-DRILLED HOLES (SEE NOTE 1)	48" O.C., WITHIN 8' OF CORNERS PROVIDE FASTENERS 24" O.C. (SEE NOTE 2)
WOOD NAILER/BLOCKING (VERTICAL)	to	MASONRY	1/4"Ø SS NAILINS OR TAPCONS	DIRECT/ PRE-DRILL	12" O.C., STAGGERED, WITHIN 8' OF CORNERS PROVIDE FASTENERS 6" O.C. (SEE NOTE 2)
WOOD NAILER/BLOCKING	to	STEEL DECKING	SS, #12 SELF-TAPPING SCREWS (LENGTH AS REQ. TO PENE. 3 THREADS, MIN)	DIRECT-SELF TAP	12" O.C., STAGGERED, WITHIN 8' OF CORNERS PROVIDE FASTENERS 6" O.C. (SEE NOTE 2)
WOOD NAILER/BLOCKING	to	STEEL FRAMING	SS, #12 SELF-DRILLING SCREWS (LENGTH AS REQ. TO PENE. 3 THREADS, MIN)	DIRECT-SELF DRILL	12" O.C., STAGGERED, WITHIN 8' OF CORNERS PROVIDE FASTENERS 6" O.C. (SEE NOTE 2)
WOOD NAILER (HORIZONTAL OR VERTICAL)	to	WOOD NAILER (HORIZONTAL)	12d SS NAILS	DIRECT	12" O.C., STAGGERED, WITHIN 8' OF CORNERS PROVIDE FASTENERS 6" O.C. (SEE NOTE 2)
WOOD NAILER (VERTICAL)	to	WOOD NAILER (VERTICAL)	12d SS NAILS	TOE NAILED	12" O.C., WITHIN 8' OF CORNERS PROVIDE FASTENERS 6" O.C. (SEE NOTE 2)
WOOD CANT	to	WOOD CURB	#14, 3" SS SCREWS W/ 1/4" PENETRATION	DIRECT	12" O.C., STAGGERED, WITHIN 8' OF CORNERS PROVIDE ANCHORS 6" O.C. (SEE NOTE 2)
CONTINUOUS CLEAT (PERIMETER FLASHINGS)	to	WOOD NAILER/BLOCKING	2" SS ROOFING NAIL W/ 3/16"Ø HEAD, MIN.	DIRECT	6" O.C., MAX., WITHIN 8' OF CORNERS PROVIDE FASTENERS 3" O.C. (SEE NOTE 2)
CONTINUOUS CLEAT (PERIMETER FLASHINGS)	to	MASONRY/CONCRETE	1 1/2" LONG, 1/4"Ø SS NAILINS	DIRECT	6" O.C., MAX., WITHIN 8' OF CORNERS PROVIDE FASTENERS 3" O.C. (SEE NOTE 2)
GRAVEL STOP/DRIP EDGE	to	WOOD NAILER	1 3/4" SS ROOFING NAIL W/ 3/16"Ø HEAD, MIN.	DIRECT	3" O.C., STAGGERED
METAL COPING	to	WOOD NAILER/BLOCKING	2" LONG, #10 SS SCREW W/NEOPRENE WASHER	DIRECT	16" O.C., MAX., WITHIN 8' OF CORNERS PROVIDE FASTENERS 8" O.C. (SEE NOTE 2)
TERMINATION BAR	to	MASONRY/CONCRETE	1/4"Ø SS NAILINS OR TAPCONS	PRE-DRILL	6" O.C.
TERMINATION BAR	to	STEEL STUD FRAMING	SS, #12 SELF-DRILLING SCREWS (LENGTH AS REQ. TO PENE. 3 THREADS, MIN)	DIRECT-SELF DRILL	EVERY STUD
METAL COUNTERFLASHING	to	METAL RECEIVER	SS, #10 SCREW W/NEOP. WASHER (LENGTH AS REQ. TO PENE. 3 THREADS, MIN)	DIRECT-SELF TAP	24" O.C. (MIN. 2 PER SIDE AT CURBS)
WOOD SHEATHING	to	STUD FRAMING/ CURB	8d SS COMMON NAILS	DIRECT	12" O.C. @ INTERIOR STUDS, 6" O.C. @ BOARD EDGES
WOOD SHEATHING	to	WOOD BLOCKING	8d SS COMMON NAILS	DIRECT	12" O.C. @ INTERIOR, 6" O.C. @ BOARD EDGES
WOOD SHEATHING	to	MASONRY WALL	1/4" Ø NAILINS OR TAPCONS	DIRECT/ PRE-DRILL	12" O.C. @ INTERIOR, 6" O.C. @ BOARD EDGES
NOTE 1		HOLES MUST BE BLOWN-OUT AND BRUSHED PRIOR TO INSTALLATION OF FASTENER			
NOTE 2		WITHIN 8' OF CORNERS, DECREASE FASTENER SPACING TO HALF OF LISTED VALUE			

#	DATE	SUBMISSIONS/REVISIONS
–	–	
–	–	
–	–	
–	–	
–	–	

ROOF REPLACEMENT
MOUNT VERNON COMMUNITY SCHOOL
ALEXANDRIA CITY PUBLIC SCHOOLS
2601 COMMONWEALTH AVENUE
ALEXANDRIA, VIRGINIA 22305

RESTORATION ENGINEERING, INC.

ISOMETRIC DETAILS
05/02/2018 | BID SET
REP | GBG | AS NOTED
908.014

A-5.10

15 OF 16

Evaluation of Existing HVAC System

Mount Vernon Community School

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Prepared for:

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November 29, 2018

PEG Potomac Energy Group Inc.
Consulting Engineers
MECHANICAL • ELECTRICAL • PLUMBING

TABLE OF CONTENTS

GLOSSARY

BAS – Building Automation System

CO2 – Carbon Dioxide

DOAS – Dedicated Outside Air System

DX - Direct Expansion

FCU – Fan Coil Unit

RH – Relative Humidity

UV – Unit Ventilator

RTU – Rooftop Unit

HVAC – Heating, Ventilation, and Air Conditioning

2 – Pipe – Where the same pipes are used for heating and cooling

4 – Pipe – Where the chilled water and hot water use separate pipes

Ventilation Air – Fresh air required by code

VRF – Variable Refrigerant Flow

VAV – Variable Air Volume

RTU – Rooftop Unit

RUV – Roof Mounted Unit Ventilator

RUL – Remaining Useful Life

UV – Unit Ventilator

EXECUTIVE SUMMARY

The school has experienced excessive levels of relative humidity (RH) during the past summer. This may have happened in the previous years as well. The extent of high RH is noticeable almost throughout the building. Signs of condensation and tracks of water drops have been noticed above the ceiling on pipe insulation, bottom of roof decks, and on steel structures.

Although the cause may be equally shared by poor building envelope and poor HVAC operation, this report mainly focuses on the HVAC systems' operations.

With exception of the library units and a small RTU for the music room, the remaining HVAC systems are about 20 years old and at the end of their average service life.

The systems do not have proper control on ventilation air quantities. Regardless of whether spaces are fully occupied or unoccupied, the systems deliver the same amount of fresh air into the space. This is severe in the case of unit ventilators. The unit ventilators' fresh air quantity approaches over 600 CFM, in most cases, while their capacity is about half of that.

Some parts of the building also seem to be under negative pressure, because the kitchen does not have a makeup air unit to off-set the exhausted air removed from the space by the hood exhaust fan.

The auditorium unit is in very poor condition. Water penetration into the supply air chamber of the unit was observed during this investigation. Some of the roof mounted equipment exposes the interior space to outside air without any dampers. In addition, multiple relief air dampers are installed backward and allow untreated air to infiltrate into the building.

All of the above conditions, in addition to a poor building envelope, have contributed to excessive levels of high RH.

None of the existing systems have dehumidification capabilities. The systems cannot be forced to lower the RH level inside the occupied spaces without overcooling the spaces.

To improve or mitigate the situation, there are two options:

Option #A

Because almost the entire existing HVAC systems are at the end of their average service life, upgrading of the systems is the best option. However, if ACPS is not ready for such a major cost impact, the second option will be to repair/replace the existing systems.

Option #B

1. Add a CO2 sensor in every classroom to control the outside air damper.
2. Replace the auditorium RTUs with single zone VAV units. Add CO2 sensors to control outside air dampers.
3. Add a makeup air unit for the kitchen exhaust.

4. Replace cafeteria's AHUs.

5. Provide fresh air for music room.

6. Insulate refrigerant lines of AHUs in the library.

7. Add a float switch to all AHUs drip pans.

8. Remove and re-install relief air dampers properly.

9. Cap any roof openings below RUVs.

10. Repair/replace piping insulation.

11. Reprogram the BAS to operate cooling systems for dehumidification without opening outside air dampers during unoccupied periods.

****

EXISTING HVAC SYSTEM

The school HVAC system consists of several different systems with various service lives.

A chiller and three (3) boilers provide cooling and heating for almost all of the classrooms through unit ventilators (UV), and to the cafeteria through two air handling units. Each classroom has one unit ventilator. Corridors and administration offices are also conditioned by chiller and boilers through fan coil units. The auditorium is conditioned by two gas heat rooftop units (RTUs). The library is conditioned by four (4) split DX Systems with hot water heating coils.

Most of the HVAC systems provide fresh air to occupied spaces. Some systems provide excessive outside air. The outside air quantities are controlled by motorized dampers.

See table number 1 for further details.

Unit Ventilators

Unit Ventilators (UV) have modulating dampers, but they are programmed to operate at two positions; fully open or fully closed. Since the air balancing report is not available, it is hard to determine the quantity of outside air flow when the dampers are in the open position. Based on visual observation, it seems like 50-60% of the UV total CFM (range of 1200-1500) is outside air when the damper is in open position.

Rooftop Units (RTU)

There are 3 RTUs serving the school. Two of the three RTUs serve the auditorium. The third RTU, which is only 3 Ton, serves the music room.

The auditorium units are in very poor condition. Both units had visible water accumulation inside the supply air compartment. One of the units had larger tears at the flex connection of its return air duct. Penetration of water inside the supply air compartment where the fan is located is a particularly bad sign because the supply air compartment is located downstream of cooling coil. There is no other coil to remove moisture from the air. Therefore, humid air will be pumped inside the auditorium.

The small RTU that serves the music room is in good condition and recently installed. However, this unit does not provide fresh air to the space.

Air Handling Units (AHU)

There are six (6) air handling units serving the school. Two of the units provide heating and cooling for the cafeteria. These two units are located on the second floor above the cafeteria. The units use hot and chilled water for heating and cooling. Both units are in poor condition. The units have only one dual temperature coil. Their coils were covered with dirt. The units' outside air dampers were functional and were opening up to 20%.

The remaining four (4) AHUs are serving the library, computer lab, Room 108, and Server room. These AHUs have DX coil for cooling and hot water coils for heating. Their condensing units are located on the roof. The outside air damper for Room 108 was not operational and appeared to be stuck in the open position. The outside air dampers for the remaining AHUs could not be verified.

Abandoned Roof Mounted Unit Ventilators (RUV)

There are multiple RUVs located on the roof. These units are abandoned and apparently serve no purpose. It appears that they were exhausting hot air from the interior spaces during the hot summer days. Their ductwork and method of closing off the ductwork to prevent air movement could not be verified.

Ceiling Mounted Fan Coil Units (FCU)

There are a few FCUs mounted above the ceiling which provide heating and cooling for the corridors near entrances. These units utilize hot and chilled water for conditioning the spaces. These units were in poor condition.

Controls and Building Automation System (BAS)

The entire HVAC systems in the building are connected to the web based BAS which was installed in 2011.

OBSERVATION AND ANALYSIS

Almost the entire occupied spaces in the school have experienced excessive level of relative humidity (RH). Occupied spaces RH based on ASHRAE's recommendation should maintain below 60%. Relative humidity is the amount of water the air can hold at a given temperature. For example, an RH of 50% means that the air is holding 50% of the moisture it can possibly contain at that temperature. At 100% RH the air is considered saturated and once the RH gets over 100%, it rains.

In occupied spaces the desired temperature is 72 to 75 deg F. Problems occur when warm air from outside enters through inactive cooling coils into the space or infiltrates through cracks and other areas of poor building envelope and is cooled to indoor temperatures. For every one degree air is cooled, the relative humidity is raised by 2.2%. Therefore if it's 90° on a summer day with a humidity level of 65%, when that air enters the occupied space and is cooled to a typical indoor temperature of 75°, the relative humidity level increases up to 98%. This is a major problem because ideal conditions for mold growth are anything with an RH higher than 70%. Additionally, when this air touches cold surfaces such as pipes, structural steel, ductwork, walls or cold water pipes, condensation will occur. Occupied spaces with higher RH, even without condensation, allow mold and mildew to grow.

During this evaluation and multiple visits to the school, signs of water damages were noticeable not only in visible surfaces of ceiling tiles and walls but also in hidden places such as above the ceiling. Although our investigative work began at the end of the cooling season, damp and in some cases wet pipe insulation was seen. Dry condensation and water marks were also visible in many locations including above ceiling spaces and at the bottom of the roof decks.

All of the above evidence indicates that the school had major high indoor RH problem in the past cooling season. We know that last summer was unusually wet and hot; however, there must have been other reasons that have caused such a high level of RH build-up inside the building that impacted almost the entire school. The focus of this evaluation report is to understand the cause(s) and recommend solutions to mitigate or improve the situation.

The common causes of excessive indoor RH in humid clients such as the City of Alexandria are as following:

1. People (A person exhales approximately 200 milliliters of water vapor per hour)
2. Water leakage through the building envelope.
3. Moisture penetration through building envelope if vapor barriers are compromised or do not exist.
4. Poor floor slabs.
5. Negative air pressure in the building with respect to outside.
6. Poor performance of HVAC systems and lack of on-demand controls of fresh air.
7. Retained construction moisture.
8. Plumbing leaks.
9. Activities such as washing, bathing, etc.

We rule out items 7 through 9 because the school is not newly constructed and has not had major renovations recently. In addition, with exception of one plumbing leak (Classroom 105), we have not seen any other active or evidence of recent plumbing leaks. And finally, the school does not have major activities of bathing and washing to generate excessive moisture.

Items 1 through 6 may have contributed to the situation. This report focuses on items #5 and #6 only, although we believe that, along with the poor HVAC systems and negative building pressure, poor building envelop has equally, if not more, contributed to the issue.

BUILDING NEGATIVE AIR PRESSURE AND POOR HVAC SYSTEMS' OPERATION

Lack of Makeup Air Unit

The Kitchen hood exhaust fan which moves a significant amount of air, creates negative air pressure in the kitchen. Because the kitchen does not have a makeup air system to offset the exhausted air, untreated air will infiltrate into other occupied spaces through doors, windows and incorrectly installed relief air dampers.

Lack of Dehumidification Capabilities

It is important to note that none of the existing HVAC systems in the school have dehumidification capability. All cooling coils respond to temperature set points only. The modern systems (RTUs, AHUs, VRF, etc.) have the capability of de-humidification without over-cooling the space.

Unit Ventilators and Fan Coil Units

The majority of the school is conditioned with unit ventilators (UV) and floor mounted fan coil units (FCU). The UVs and FCUs have a single dual temperature coil. They cannot provide simultaneous heating and cooling. Their outside air dampers are also 2-poisiton; open to outside or fully closed. When they open to outside during occupied hours, they stay fully open regardless if the spaces are occupied or not. During low cooling load (no occupancy or cloudy/rainy days) the cooling coil cycles off more often but flow of humid outside air into the spaces remain the same. Under the above condition a significant amount of moisture will be forced into the interior spaces. This will be at higher rates at the north exposure due to lower cooling load. The amount of outside air that is forced in by the UVs and FCUs, enters the ceiling spaces through return/relief air louvers and continues to move into the corridor ceilings through transfer air openings in the walls between classrooms and corridors.

There are multiple openings with barometric dampers located in the outside walls to relieve excess air to outside. However, the barometric dampers are installed backward, which will not allow air to leave the building. Instead they allow outside untreated air to enter the building. The outside air infiltration through these dampers intensifies during unoccupied hours because the building remains under neutral or slightly negative pressure if some exhaust fans remain active.

Rooftop Units (RTU)

The small RTU serving the music room does not have fresh air capabilities. Therefore, regardless how it operates, it wouldn't increase humidity in the space, it would reduce it.

The auditorium RTUs based on our observations have increased the indoor RH for the following reasons:

- Water penetration to the supply air compartment. Our site visit to investigate the RTUs occurred on a sunny day, however, the day before was raining. During our visit, the supply air compartment had enough moisture that can be categorized sever and further investigation is required if these RTUs are continued to be used.

- The tear on the return duct on the roof will allow rain water and hot humid air to get into the unit and eventually into the auditorium.

- The dampers may not operate properly. The damper operation of the RTUs could not be verified due to inaccessibility.

Air Handling Units (AHU)

The Cafeteria AHUs had very filthy coils. Dirt insulates the coils and reduces their efficiency significantly. An inefficient chilled water coil will not remove the moisture adequately.

The four (4) AHU serving the library, Room 108 and Computer Lab have un-insulated refrigerant lines and at least one of them (in Room 108) had visible condensation on the pipe surface.

Abandoned Roof Mounted Unit Ventilators (RUV)

RUVs are abandoned, however the extent of protecting the building from elements through these units is unknown. While we put a good effort into discovering anything that we could about the roof penetrations, ductwork, and other related items to these units, we were not successful. Removing the caps from a couple of them to provide visual access will be helpful.

Two possibilities exist about the RUVs. It will be best if they are capped at the roof level and the caps are insulated. However, it is possible that the roof openings are not currently capped and open ended ductwork from the units is distributed to several spaces.

Ceiling Mounted Fan Coil Units (FCU)

Only a few of these units exist in the school. One of them was found to be in poor condition with the outside air intake open and visible from the corridor. This is the kind of condition that opens the building to outside without any dampers and allows excessive untreated air infiltration into the building.

Controls and Building Automation System (BAS)

The building automation system seems to be in very good condition. During our last visit we tested the system for operation and found it functioning properly. The operator was able to command units on and off through his laptop and monitor the systems operations, room temperature, and status of the systems major components.

What is not clear is the operation of the system during holidays and other unoccupied periods and if the systems were completely turned off or if the systems are operating as the building is fully occupied.

Not running the systems as it is scheduled for non-occupied mode during holydays, school vacations, weekends, and nights will allow accumulation of high humidity in all spaces which will then be absorbed by building materials, furniture, carpets, papers, books, etc.

Operating the systems in occupied mode while the building is not occupied or lightly occupied, the outside air dampers will remain open to the same positions as fully occupied building and create a cold but damp indoor environment because the systems cooling could not run for long enough time to remove moisture from the space due to low cooling load.

Additional Miscellaneous Items

1. Condensate drain in some cases is piped to roof drain without back water valve
2. Condensate pump failure and no hose connection (FCU)
3. Oversized cooling systems

OPTIONS

The existing HVAC systems for the most part are over 20 years old. For average useful life of the existing systems refer to table 1.

This condition provides an opportunity for replacing the existing systems while the school undergoes other building components improvements. The following is a list of viable systems that could be considered for upgrading of the school's HVAC system along with their advantages and disadvantages.

Option #1- Variable Refrigerant Volume (VRF)

VRF system uses refrigerant pipes for distribution and transportation of energy (heating and cooling). The system's terminal units are ceiling mounted cassettes, floor mounted console units, concealed fan coil units, wall mounted units, and Air Handling Units.

Advantages of VRF Systems:

a. Very efficient and quieter operation.
b. Easy to install in existing buildings because installation of large ducts is not required.
c. Better comfort due to individual unit controls for simultaneous heating and cooling.
d. Dehumidification capability without over cooling the space.

Disadvantages of VRF Systems:

a. Higher initial cost compared to packaged rooftop unit and ductwork. The cost of VRF system is the same as 4-pipe hydronic (hot/chilled water) system.
b. VRF system cannot provide fresh air for occupied spaces. The systems are manufactured to respond to heating and cooling of occupied spaces as long as conditioned fresh air is provided by other means. Therefore, a dedicated outside air system (DOAS) must be provided along with VRF system to deliver conditioned ventilation air.
c. Shorter life compared to RTUs and hydronic systems. VRF systems average useful life is 15 years compared to 20 years of other systems (although VRF system manufacturers claim otherwise).

Option #2 - Hydronic Four (4) - Pipe System

This system uses boilers, chillers, pumps, and cooling tower, similar to what the school uses with exception of separate pipes for chilled water and hot water. The terminal units of hydronic systems consist of air handling units, fan coil units, and unit ventilators.

Advantages of Hydronic Systems:

a. Hydronic 4-pipe systems have the same advantages that VRF systems do, with the exception of efficiency and service life. The hydronic systems are less efficient due to use of large pumps that operate 24/7, but they have longer service lives by about 5 years.

Disadvantages of Hydronic Systems:

a. Higher maintenance cost.

Option #3 - Packaged VAV Rooftop Units

Packaged rooftop units consist of RTUs, ductwork, VAV boxes, and diffusers.

Advantages of Packaged VAV RTUs:

a. Low initial cost.
b. Low maintenance cost.
c. Simultaneous heating and cooling.

d. Provide conditioned ventilation air. Use of DOAS is not necessary.

Disadvantages to Packaged VAV RTUs:

a. Requires large ductwork, chases, and roof and floor penetrations. All of which are very disruptive to existing buildings.

RECOMMENDATIONS

Based on our experience with new and existing schools HVAC systems design, we recommend the following:

- Install VRF systems for all classrooms, admin, offices and other small rooms.
- Install DOAS to provide ventilation air for all spaces served by VRF systems.
- Install RTUs for all large spaces such as Cafeteria, Auditorium, Library, and Gym.

If existing 2-pipe hydronic system that the school currently uses had 10 or more years of service life, our recommendations would have been different. We would have recommended 4-pipe hydronic system, without unit ventilators.

If the funding is not available, or ACPS is not in a position to upgrade the HVAC systems, we recommend the following:

12. Add a CO2 sensor in every classroom to control outside air damper.
13. Replace the auditorium RTUs with single zone VAV units. Add CO2 sensor to control outside air dampers.
14. Add a makeup air unit for the kitchen exhaust.
15. Replace cafeteria's AHUs.
16. Provide fresh air for the Music Room.
17. Insulate refrigerant lines of AHUs in the Library.
18. Add a float switch to all AHUs drip pans.
19. Remove and re-install relief air dampers properly.
20. Cap any roof openings below RUVs.
21. Repair/replace pipe insulations.
22. Reprogram the BAS to operate cooling systems for dehumidification purpose without opening outside air dampers during unoccupied periods.

*It is important to note that none of the existing HVAC systems in the school have dehumidification capabilities. All cooling coils respond to temperature set points. The modern systems (RTUs, AHUs, VRF, etc.) have the capability of dehumidification without over-cooling the space.

ATTACHEMENTS

Table #1

Equipment	Capacity (Tons)	Location	Service	Age	RUL	Remarks
AHU-1	10.5	2nd Floor Mechanical Closet	Cafeteria	20	0	No secondary drip pan, sits on a wooden mezzanine
AHU-2	10.5	2nd Floor Mechanical Closet	Cafeteria	20	0	No secondary drip pan, sits on a wooden mezzanine
Boilers	1026 MBH each	Mechanical Room	Entire School	20	5	Good Condition. Due for replacement in about 5 years.
Chiller (CH-1)		Mechanical Room	Entire School	21	0	Reaching the end of its useful life.
Cooling Tower (CT-1)	-	Roof	Chiller	21	0	Rear supports have deteriorated due rain water accumulation
FCU-A	0.58	Small Corridor, Break room, Lobby	Corridor, Break Room, Lobby	20	0	Useful life has ended, recommend replacing soon.
FCU-B	0.63	Computer, lab, Toilet, Stairs	Computer Lab, Toilet, Stairs	20	0	Useful life has ended, recommend replacing soon.
FCU-C	0.92	Vestibule	Vestibule	20	0	Useful life has ended, recommend replacing soon.
FCU-D	1.3			20	0	Useful life has ended, recommend replacing soon.
FCU-E	2.75	Corridors, Kitchen	Corridors, Stairs, Kitchen	20	0	Useful life has ended, recommend replacing soon.
FCU-F	2.75			20	0	Useful life has ended, recommend replacing soon.
FCU-G	0.63	Stairs	Stairs	20	0	Useful life has ended, recommend replacing soon.
FCU-H	1.12	Lobby, Kitchen	Lobby, Clinic, Kitchen	20	0	Useful life has ended, recommend replacing soon.
Pumps	-	Mechanical Room	Chiller and Boilers	~20	0	Outlived their useful life. Recommend replacing soon.
RTU-1	20.5	Auditorium roof	Auditorium	20	0	Deteriorated exterior. Useful life has ended.
RTU-2	20.5	Auditorium roof	Auditorium	20	0	Deteriorated exterior, large tear/hole in flex duct connection

SS-1		Roof		1	14	Excellent condition
SS-2		Roof		1	14	Excellent condition
SS-3		Roof		1	14	Excellent condition
SS-4		Roof		1	14	Excellent condition
UV-A	1.125	Classroom	Classroom	20	0	Useful life has ended, recommend replacing soon. OA dampers are set to open 100%.
UV-B	1.97	Classroom	Classroom	20	0	Useful life has ended, recommend replacing soon. OA dampers are set to open 100%.
UV-C	4.73	Classroom	Classroom	20	0	Useful life has ended, recommend replacing soon. OA dampers are set to open 100%.
UV-D	3	Classroom	Classroom	20	0	Useful life has ended, recommend replacing soon. OA dampers are set to open 100%.
UV-E	3.92	Classroom	Classroom	20	0	Useful life has ended, recommend replacing soon. OA dampers are set to open 100%.
UV-F	1.33	Classroom	Classroom	20	0	Useful life has ended, recommend replacing soon. OA dampers are set to open 100%.

PHOTOGRAPHIC DOCUMENTATION

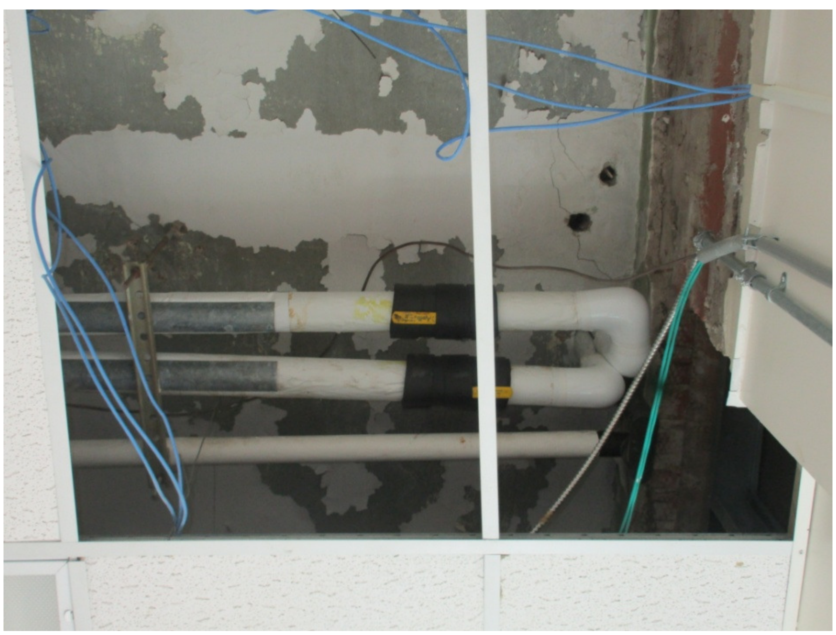
Exterior wall is only covered by gypsum board in ceiling space. No vapor barrier and insulation present. (Typical most above most classrooms' ceiling)

Typical Unit Ventilator outside air damper actuator.

Water marks found along joists and ceiling. (Above the corridor by room 318)

Tear in return air flex duct connection to RTU mixing box. (Auditorium RTU)

Un-insulated refrigerant line condenses above ceiling. (Room 108)



Sign of excessive moisture above the ceiling which cause the paint to peel off and created stain on the pipe insulations.

Typical Fan Coil Unit (FCU)

Sign of Excessive moisture and condensation on the door and ceiling.

Close-up image indicating top of the door with condensation tracks.

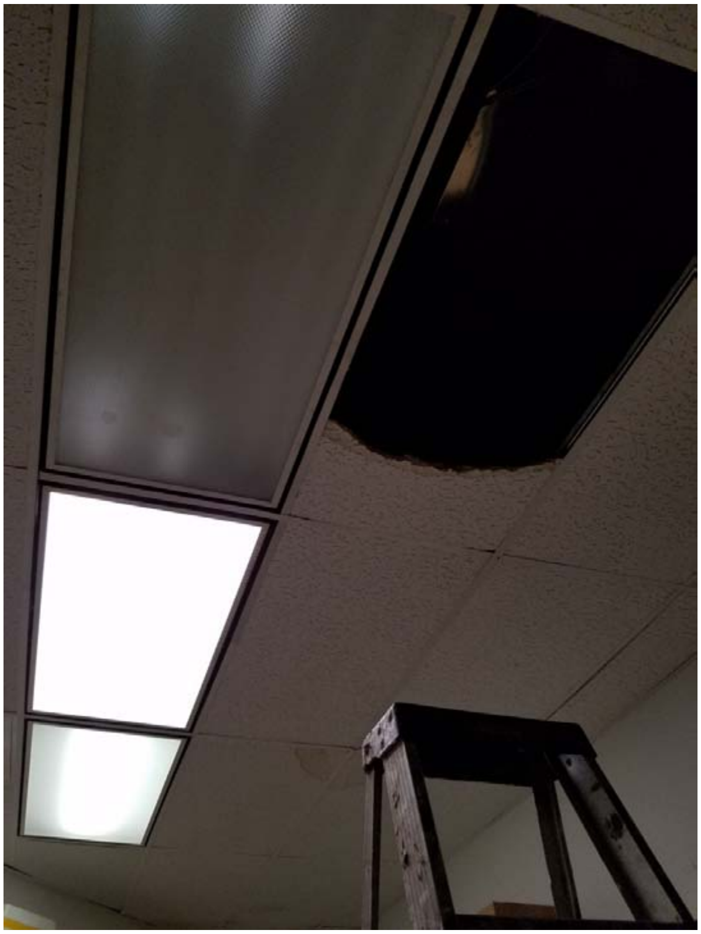
Roof over the kitchen. No makeup air unit for the exhaust air.

Abandoned Roof Unit Ventilators (RUV)

Ceiling damage from Plumbing leak (room 105)

Sign of condensation on pipe insulation and floor deck. (Room 102)

Uninsulated test port sticking out of the pipe. (Room 102)



Ceiling damage due to condensation from AC unit above. (Room 106 B)

The condensate drain lines for three units in this area are connected to the rain leader without any back-water valves.

Sagging Ceiling tiles, indicative of excessive RH (library)

Roofmounted Ventilator Units (the units may have opened the buiding envelop to outside)

Return air louver which is open to outside (the light dots at the lower right corner indicate daylight)

Relief Air Louver (lower louver above the first floor window) With Backward Damper

November 15, 2018

Mr. Michael Detomo, RA
Principal
Cole & Denny Architects
333 North Fairfax Street,
Alexandria, Virginia 22314

RE: Report of Water Intrusion Assessment Services – Mount Vernon Community School, 2601 Commonwealth Avenue, Alexandria, Virginia 22305

Dear Mr. Detomo:

Cole & Denny Architects has been contracted by Alexandria City Public Schools (ACPS) to conduct a Water Intrusion Assessment at the Mount Vernon Community School located at 2601 Commonwealth Avenue in Alexandria, Virginia. The contracted services include a building assessment for mechanical, electrical, plumbing (MEP) systems, roofing systems, the building envelope, and structural systems. As part of this effort, Applied Environmental provided assistance during the building survey to assess areas of water damage and/or microbial (mold) growth. Additionally, Applied Environmental conducted an Asbestos Verification Survey, which included a review of the school's existing Asbestos Management Plan and limited bulk sampling of additional suspect asbestos-containing material (ACM) to identify known or assumed ACM impacted by water damage. The goal of our effort was to provide recommendations for microbial remediation in areas of identified microbial growth and recommendations for removal and proper handling of known or assumed ACM in areas where proposed renovations and repairs may disturb them.

Identifying and summarizing the locations of water intrusion sources, elevated moisture conditions, and associated mechanical or structural deficiencies, as well as providing recommendations for related renovations or repairs, was primarily the responsibility of others within the Cole & Denny survey team. While Applied Environmental provided input and shared observations regarding these items during our field survey activities, we understand that a compilation of the causes of water damage in the building and recommended remedial actions will be reported to ACPS by others under separate cover.

VISUAL MOLD SURVEY OBSERVATIONS AND RECOMMENDATIONS

Prior to conducting our visual mold survey, Applied Environmental was provided a copy of a mold sampling survey report prepared by Aerosol Monitoring & Analysis, Inc. (AMA), dated October 11, 2018. The AMA survey included both air and surface sampling and identified visible water damage (VWD), apparent mold growth (AMG), and elevated airborne fungal spore counts in multiple locations throughout the school. Applied Environmental's field survey attempted to confirm AMA's reported observations and supplement that information with our observations of changed or previously unreported conditions.

The following general remedial actions are recommended for large areas of water damaged materials and suspected microbial growth in occupied schools and commercial buildings. Variations of these general guidelines can be used in areas of the school where the amount of visible mold growth is limited (e.g., minor mold growth on a single ceiling tile in a classroom).

General Recommendations:

1. Remediation activities should be performed according to the guidance provided by the EPA document “Mold Remediation in Schools and Commercial Buildings” (EPA 402-K-01-001). A qualified microbial abatement contractor, using trained mold remediation employees, should conduct all remediation work.

2. Before any successful remediation can be performed, sources of water intrusion or elevated moisture conditions must be identified and eliminated.

3. All remediation activities should be conducted after school hours and after the areas have been vacated by students and staff.

4. Trained individuals wearing proper personal protective equipment (PPE) should perform remediation work. Personal protective equipment should include, at minimum, protective gloves, safety glasses, and an N95 half-face respirator (dust mask). Disposable coveralls are also recommended.

5. Removal areas exhibiting more than ten square feet of active microbial growth should be isolated in a negative pressure enclosure to prevent contamination of adjacent areas. High efficiency particulate air (HEPA) filtration of exhausted air should be performed. Any supply air diffusers or return air grilles within the isolated area should be sealed. For smaller removal areas not necessitating a negative pressure enclosure, a polyethylene drop cloth should be used beneath the removal area, at minimum.

6. Drywall exhibiting visible microbial growth or water damage, such as swelling, buckling, disfigurement, or severe water marking should be removed. All water-damaged materials are susceptible to future microbial contamination. When damaged materials are removed, a minimum of one foot of unaffected material on all sides should be removed as a safety factor.

7. If affected wall materials are removed, underlying insulation should be removed for cleaning and inspection of the wall cavity. Insulation found adjacent to water damaged materials or materials exhibiting microbial growth should be discarded.

8. Interior wall spaces, metal or wooden studs, exterior walls, and adjacent materials should be thoroughly pre-cleaned with a HEPA vacuum. Non-porous surfaces should be wet wiped and sanitized with an appropriate fungicide or other disinfectant sporicidal solution. Aggressive agitation with a stiff brush may be necessary. Once cleaning is complete, the wall cavity and all adjacent materials should be dried thoroughly and re-cleaned with a HEPA vacuum.

9. Mold contaminated materials should be promptly sealed in disposal bags before removal from a negative pressure enclosure or unenclosed work area to prevent contamination of adjacent areas.

10. All areas of mold remediation should be thoroughly dried before reconstruction. Aggressive drying using mechanical air movement and dehumidification can speed drying and is desired once all mold contamination is removed. Accelerated drying is generally preferable to natural drying to prevent reoccurring mold growth on wet materials.

11. Where feasible, materials that exhibited microbial growth or water damage and were cleaned should be treated with a mildew resistant coating.

12. When carpeting becomes wet, aggressive drying should be initiated immediately. If possible, carpeting should be detached from the sub-floor to promote drying of the underside of the material and the floor below. If padding is installed, it should be discarded. Carpeting that has remained wet for more than 48 hours, or that is flooded repeatedly, should be discarded.

The following table lists the areas of observed suspected mold growth observed during our field survey, a general description of the type and approximate quantity of affected materials, and material specific recommendations for remediation. It should be noted that other water damaged building materials were observed in numerous areas throughout the school, but without visible evidence of mold growth.

Room/Area	Observed Mold Growth	Recommendations
Mechanical Room 133	Suspected mold growth on paper-wrapped fiberglass insulated piping sporadically throughout.	Surfaces of intact insulation with mold growth should be damp wiped with a detergent solution, dried thoroughly, and sealed with an antimicrobial coating (e.g., Fosters 40/20, Killz, etc.). Damaged or significantly deteriorated insulation should be removed and replaced.
Electrical Room in Mechanical Room 133	Suspected mold growth on concrete masonry unit (CMU) wall behind door, below electrical panel.	Clean surface contamination with detergent solution and stiff brush. Treat with antimicrobial coating once dry.
Main Lobby	Suspected mold growth on ceiling tile above door to courtyard.	Remove ceiling tile, place directly in waste bag, and replace with new ceiling tile.
1st Floor Corridor East of Auditorium	Accumulated particulate and suspected mold growth on supply air diffusers.	Clean surface contamination with detergent solution.

Room/Area	Observed Mold Growth	Recommendations
Stair 3	Suspected mold growth on approximately four ceiling tiles. Suspect mold growth on plaster wall beneath fan coil unit. Potential mold growth beneath damaged and delaminated floor tiles.	Remove ceiling tiles, place directly in waste bag, and replace with new ceiling tiles. Clean wall surface contamination with detergent solution. Damaged floor tiles should be removed and the subfloor surface should be cleaned with a HEPA vacuum and treated with an antimicrobial solution, provided the solution would not interfere with new flooring replacement.
Room 105	Suspected mold growth on ceiling tile near west window.	Remove ceiling tile, place directly in waste bag, and replace with new ceiling tile.
Room 108	Suspected mold growth on ceiling tile in northeast corner.	Remove ceiling tile, place directly in waste bag, and replace with new ceiling tile.
Room 112	Suspected mold growth on plaster east wall and beside door.	Clean surface contamination with detergent solution.
Room 119	Suspected mold growth on ceiling tile in northeast corner	Remove ceiling tile, place directly in waste bag, and replace with new ceiling tile.
Room 121	Suspected mold growth on ceiling tile in two locations along west wall.	Remove ceiling tiles, place directly in waste bag, and replace with new ceiling tiles.
Room 123	Suspected mold growth on ceiling tile in northwest corner	Remove ceiling tile, place directly in waste bag, and replace with new ceiling tile.
Room 201	Suspected mold growth on ceiling tile in northwest corner.	Remove ceiling tile, place directly in waste bag, and replace with new ceiling tile.
Teacher’s Lounge 231	Suspected mold growth on two ceiling tiles along east wall.	Remove ceiling tile, place directly in waste bag, and replace with new ceiling tile.
Work Room between Lounge 231 and Room 232	Suspected mold growth on two ceiling tiles along east wall.	Remove ceiling tile, place directly in waste bag, and replace with new ceiling tile.
Room 233	Suspected mold growth on ceiling tiles in the northwest corner and southeast corner.	Remove ceiling tiles, place directly in waste bag, and replace with new ceiling tiles.

Room/Area	Observed Mold Growth	Recommendations
2nd Floor, AHU-1 Mechanical Room	Suspected mold growth on drywall ceiling along west wall, approximately 20 square feet. Suspected mold growth on wood decking above the drywall ceiling. Suspected mold growth on paper-wrapped fiberglass insulated piping.	Construct a negative pressure enclosure with polyethylene curtained doorway and two-stage decontamination unit (dirty room and clean room) at doorway. Exhaust the negative air machine outdoors, if possible. Remove impacted drywall ceiling materials. Place removed material directly into waste bags for transport through the decontamination unit. Clean impacted wood decking, floor, and terra cotta block walls with a HEPA vacuum. Porous, non-essential materials (e.g., cardboard, paper, debris, etc.) should be removed and discarded. Non-porous materials to remain should also be cleaned with a HEPA vacuum. Clean surface contamination on wood ceiling deck and terra cotta block wall with detergent solution and stiff brush. Intact pipe insulation with surface suspected mold growth should be damp wiped with a detergent solution, dried thoroughly, and sealed with an antimicrobial coating. Damaged or significantly deteriorated insulation should be removed and replaced. Re-clean all surfaces within the Mechanical Room with a HEPA vacuum. After thorough drying, treat all remaining wood surfaces with antimicrobial solution.

In addition to the areas of suspected visible mold growth summarized in the preceding table, several areas were identified that did not currently exhibit visible suspected mold growth, but presented conditions particularly conducive to mold growth and/or indicative of unseen microbial amplification. The following table contains a summary of these areas.

Room/Area	Conditions Observed	Recommendations
Room 122	Strong moldy odor, no suspected visible mold growth observed.	No obvious sources of visible mold growth were observed. Additional investigation in this area may be warranted.
Room 234	Strong moldy odor in storage closet in northwest corner, no suspected visible mold growth observed. Several large stacks of books observed on the floor.	Books should be removed from the closet and assessed for water damage and mold growth. Impacted books should be discarded. Additional investigation in the closet once books are removed may be warranted.
Room 219	Numerous paint blisters containing intrusion water present on wall surface above entrance to small restroom.	No suspected mold growth was observed on or in the paint blisters. Water intrusion source, likely the roof penetration for the exhaust fan/duct in the adjoining restroom, should be eliminated. Blistered wall should be stripped of damaged paint layer, dried thoroughly, and repainted.
2nd Floor, Nursing Room above Stairway	Condensate pump for FCU not functional and appeared to be full of water. Overflows of condensate onto carpet and adjoining plaster wall appear to have been a recurring condition.	Condensate pump should be repaired and properly reinstalled or replaced. Carpet should be removed and the underlying subfloor should be inspected for additional damage or mold growth. Subfloor should be cleaned, dried, and new carpet installed.
Auditorium	Significant water intrusions have been reported in the Auditorium over the past months. The Auditorium was partially flooded during our field survey on November 6. All carpet in the Auditorium was removed in September 2018 and has not yet been replaced.	No suspected mold growth was observed in the Auditorium. However, potential mold growth on upholstered seating remains a concern as long as chronic water intrusion continues. Water intrusions from the roof and beneath the subfloor should be eliminated. Dehumidifiers and HEPA filtered air movers should remain employed as a preventive measure until water intrusions are eliminated.

Room/Area	Conditions Observed	Recommendations
Throughout Building	Open windows were observed in numerous rooms during our field survey activities, all of which were conducted outside of normal operating hours.	Open windows provide an unrestricted pathway for unconditioned, high humidity air, and precipitation in extreme cases, to enter the building. All staff should be reminded to close any open windows prior to leaving for the day.

ASBESTOS VERIFICATION SURVEY AND RECOMMENDATIONS

Applied Environmental reviewed the school's Asbestos Management Plan to complete an Asbestos Verification Survey to identify known or assumed ACM that may be disturbed during remediation of water intrusion issues at the school. The Asbestos Verification Survey was expressly limited to those materials considered subject to disturbance during proposed remediation activities. Known or assumed ACM documented in the Asbestos Management Plan that will likely be disturbed during water intrusion remediation includes:

- Black seam mastic on fiberglass pipe insulation,
- Black seam mastic on foil wrapped fiberglass duct insulation, and
- Mudded elbows and fittings on 2" to 4" outside diameter pipes.

During the verification survey, several additional materials were identified that had not been sampled and/or clearly documented in the Asbestos Management Plan that were either impacted with water damage, contained visible suspected mold growth, or had a high potential of disturbance during future remediation activities. Limited bulk sampling of these materials was conducted in general accordance with Occupational Safety and Health Administration Standard 29 CFR 1926.1101 inspection protocol.

Sampling of roofing materials was not completed at this time. Prior to replacement or repairs of the roof, a comprehensive asbestos survey should be completed inclusive of the entire roof system. This survey must be coordinated with ACPS to ensure that ACPS personnel or approved contractor representatives are available to patch sampling locations and provide institutional knowledge regarding ages of construction and renovation of roof sections.

A total of 51 representative bulk samples were collected from 20 suspect homogeneous materials in general accordance with EPA recommended asbestos inspection techniques. Sampling was specifically limited to materials observed to be impacted with visible suspected mold growth, water damage, and/or had a high probability of future disturbance during remediation activities.

All of the collected samples will be submitted to AMA Analytical, Inc. of Lanham, Maryland (AMA) for analysis by Polarized Light Microscopy (PLM) in accordance with EPA testing methods. Samples will be analyzed by EPA Method for the Determination of Asbestos in Bulk Insulation Samples (EPA 600M4-82-020). The AMA laboratory is be accredited by the U.S. Department of Commerce, National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program (NVLAP) for bulk asbestos identification by

PLM. To date, ACPS has not authorized analysis of the collected asbestos samples. A summary of the materials and awaiting analysis is included in the following table:

Material Code	Material Description	Sample Number	Sample Locations*	Asbestos Content
PL1	Gray rough coat with white, rough textured skim coat plaster walls and ceilings	01, 03, 04, 05, 08, 31, 32	Corridor at Room 123, Room 120, Corridor at Cafeteria (Ceiling), Room 232, Room 213 (Ceiling), Room 319, Corridor at Room 323 (Ceiling)	Not Determined
CT1	2' x 4' white ceiling tile with dot, pinhole, and dense small gouges	02, 07	Corridor at Room 123 and Corridor at Cafeteria	Not Determined
CT2	2' x 4' white ceiling tile with pinholes and sparse, skinny, serpentine fissures	06, 09	Room 232 and Room 213	Not Determined
CT3	2' x 4' white ceiling tile with uniform dots and deep, jagged fissures	10, 11	2nd Floor Teacher's Restroom and Corridor at Elevator	Not Determined
CT4	2' x 4' white ceiling tile with uniform dots, holes, and small rounded gouges	12, 13	Corridor at Elevator and Conference 229	Not Determined
PL2	Brown rough coat with white smooth skim coat plaster walls and ceilings	14, 33, 37, 38, 39, 44, 47, 52	2nd Floor Teacher's Restroom, Corridor at Room 223 (ceiling), Corridor at Room 225, Room 221, Room 227, Room 227 (ceiling), Auditorium, Room 221 (ceiling)	Not Determined
AD1	Dark brown glue dots on 1' x 1' hole grid ceiling tile	15, 35	2nd Floor Teacher's Restroom, Corridor at Room 223	Not Determined
PG1	Grayish-brown rough coat plaster/parging	16, 17, 18	2nd Floor, AHU-1 Mechanical Room	Not Determined
DJ1	Drywall with brown paper and cream joint compound	19, 20	2nd Floor, AHU-1 Mechanical Room Ceiling	Not Determined
SM1	Cream seam mastic on white paper wrapped yellow fiberglass pipe insulation	21, 22	2nd Floor, AHU-1 Mechanical Room	Not Determined
SM2	Off-white seam mastic on canvas wrapped fiberglass duct insulation	23, 24	2nd Floor, AHU-1 Mechanical Room	Not Determined
SM3	Cream seam mastic on canvas wrapped fiberglass duct insulation	25, 26	2nd Floor, AHU-1 Mechanical Room	Not Determined
AD2	Brown glue dots on 1' x 1' hole grid ceiling tile	27, 28	Room 211	Not Determined
CT5	1' x 1' hole grid ceiling tile (with AD2)	29, 30	Room 211	Not Determined

Material Code	Material Description	Sample Number	Sample Locations*	Asbestos Content
CT6	1' x 1' hold grid ceiling tile (with AD1)	34, 36	Corridor at Room 223	Not Determined
DJ2	Drywall with brown paper and white joint compound at window bulkheads	40, 45	New Window Installations in Classroom 221, Classroom 227	Not Determined
DJ3	Drywall with dark brown paper, no joint compound	41, 46	New Window Installations in Classroom 221, Classroom 227	Not Determined
CT7	2' x 4' white ceiling tile with dense dots and small hole pattern	42, 43	Classroom 221	Not Determined
CM1	Tan carpet mastic	48, 49	Auditorium	Not Determined
CBM1	Brown cove base mastic	50, 51		Not Determined
* The Sample Locations refer only to the locations where bulk samples of these materials were collected, and do not represent all areas within the building where these materials are present.				

Once the collected samples are submitted for laboratory analysis and the results are received, a final report will be issued detailing the results of laboratory analysis, along with photographs of any sampled materials identified as ACM.

The asbestos-containing black seam mastic on pipe and duct insulation identified in the school's existing Asbestos Management Plan are non-friable materials as defined in the EPA National Emissions Standard for Hazardous Air Pollutants (NESHAP). A non-friable ACM is defined as any material that contains more than one percent asbestos by weight that hand pressure cannot crumble, pulverize, or reduce to powder when dry. At the time of the survey, the asbestos-containing black seam mastic was in good condition where observed.

The asbestos-containing mudded elbows and fittings on 2" to 4" water pipes is considered a friable material in the EPA NESHAP. A friable ACM is defined as any material containing greater than one percent asbestos that, when dry, can be crumbled, pulverized or reduced to powder with hand pressure. All of the mudded elbows and fittings observed during our survey were in good condition.

Any known or assumed ACM that will be impacted by renovation or remediation activities must be removed by a qualified asbestos abatement contractor prior to being impacted in accordance with all applicable EPA, OSHA, and Commonwealth of Virginia regulations. The OSHA Asbestos in Construction Standard, 29 CFR 1926.1101 requires that any contractor performing work that could impact materials containing asbestos be informed of the testing results, and must take appropriate actions to comply with the requirements of the OSHA Standard.

LIMITATIONS

Our survey was specifically focused on areas of mechanical or structural deficiencies that may be conducive or causal to water intrusion identified by the Cole & Denny survey team or directly observed during our field survey activities. It is important to note that, during our survey on November 6, precipitation was occurring and numerous active water intrusions were observed throughout the school. The active water intrusions were evidenced by freshly wetted ceiling materials throughout the school, the placement of trash cans and buckets to capture active leaks in some areas, and pooling of newly introduced flood water in the Auditorium floor. Water intrusion into the school appears to be an ongoing and widespread condition. Areas of additional water damaged materials may now be present at the school that were not observed during our field survey.

The results of our mold and asbestos survey should not be construed as definitively inclusive of all water damaged materials, as conditions may have changed since our field survey was conducted. Additionally, Applied Environmental stresses that the asbestos sampling was extremely limited in nature and specifically targeted water damaged materials. Our Asbestos Verification Survey should not be construed as a comprehensive survey completed in accordance with EPA Standards 40 CFR 763, Subpart E, Asbestos Hazard Emergency Response Act (AHERA). If, during the course of any planned remediation efforts, materials are anticipated to be disturbed that are not specifically documented in the school's existing Asbestos Management Plan or our targeted Asbestos Verification Survey, those materials must be sampled for laboratory analysis or assumed to contain asbestos.

Depending upon what known or assumed ACMs may be disturbed during the proposed renovations, an asbestos abatement specification may be required for the project. An asbestos abatement specification cannot be prepared without knowing the precise scope of renovation and potential ACM disturbance. Therefore, the final recommendations provided as a result of our Asbestos Verification Survey will be general in nature and should not be construed to represent an asbestos abatement specification, which must be prepared by a Commonwealth of Virginia licensed Asbestos Project Designer.

If you have any questions about our proposal or approach to the project, please feel free to call.

Sincerely,

Bradley C. Pearson, CIH, CHMM
Division Manager
Occupational Health and Safety

February 14, 2019

Mr. Michael Detomo, RA
Principal
Cole & Denny Architects
333 North Fairfax Street,
Alexandria, Virginia 22314

RE: Summary Report of Limited Asbestos-Containing Material Sampling – Mount Vernon Community School, 2601 Commonwealth Avenue, Alexandria, Virginia 22305

Dear Mr. Detomo:

Cole & Denny Architects was contracted by Alexandria City Public Schools (ACPS) to conduct a Water Intrusion Assessment at the Mount Vernon Community School located at 2601 Commonwealth Avenue in Alexandria, Virginia. The contracted services included a building assessment for mechanical, electrical, plumbing (MEP) systems, roofing systems, the building envelope, and structural systems. As part of this effort, Applied Environmental provided an Asbestos Verification Survey, which included a review of the school's existing Asbestos Management Plan and limited bulk sampling of additional suspect asbestos-containing material (ACM) to identify known or assumed ACM impacted by water damage. The goal of this effort was to provide recommendations for removal and proper handling of known or assumed ACM in areas where repairs may disturb the material.

SURVEY METHODOLOGY

This limited scope hazardous materials survey was conducted by an EPA accredited and Commonwealth of Virginia licensed asbestos inspector. The school's existing Asbestos Management Plan was reviewed during the current survey. Sampling was specifically limited to materials observed to be impacted with visible suspected mold growth, water damage, and/or had a high probability of future disturbance during remediation activities. The survey should not be construed as a complete building survey for the purposes of compliance with AHERA 40 CFR 763.

In the event that suspect ACM was encountered with a likelihood for potential disturbance remediation and/or renovation that was not previously identified in the existing Asbestos Management Plan, those materials were sampled and submitted for laboratory analysis in general accordance with AHERA 40 CFR 763 and OSHA Standard 29 CFR 1926.1101 inspection and sampling protocol within the limited survey area. Suspect ACM was separated into homogeneous areas. A homogeneous material is defined as a building material that is uniform in color and texture. A summary of the sampled materials including their assigned material code, location, sample number, and quantity (if ACM) is presented in Appendix A, "Homogeneous Material List."

A total of 52 representative bulk samples were collected of suspect ACM. The suspected ACM identified and sampled during the asbestos survey included the following:

- Suspended acoustical ceiling tiles,
- Adhered ceiling tiles in the Original Building and 1940 to 1949 Additions,
- Brown adhesive for ceiling tiles in the Original Building,
- Dark brown adhesive for ceiling tiles in the 1940 to 1949 Additions,
- Plaster walls and ceilings in the Original Building and 1940 to 1949 Additions,
- Parging on plaster and masonry walls in the AHU-1 and AHU-2 Mechanical Rooms,
- Seam mastics on paper wrapped fiberglass pipe insulation in the AHU-1 and AHU-2 Mechanical Rooms,
- Seam mastic on canvas wrapped fiberglass duct insulation in the AHU-1 and AHU-2 Mechanical Rooms,
- Drywall and joint compound in the AHU-1 and AHU-2 Mechanical Rooms and around new window installations,
- Carpet mastic in the Auditorium, and
- Cove base mastic in the Auditorium.

All collected bulk samples were submitted to the AMA Analytical Services, Inc. (AMA) analytical laboratory of Lanham, Maryland for analysis by Polarized Light Microscopy (PLM) in accordance with EPA testing methods. Samples were analyzed by EPA Method for the Determination of Asbestos in Bulk Insulation Samples (EPA 600M4-82-020). Aerobiology is accredited by the U.S. Department of Commerce, National Institute of Standards and Technology (NIST), National Voluntary Laboratory Accreditation Program (NVLAP) for bulk asbestos identification by PLM.

SURVEY RESULTS

The laboratory analysis results are included in Appendix B, "Laboratory Analysis Report." According to the laboratory analysis report, the following materials sampled during the current survey activity were reported as ACM:

- Dark brown glue dot adhesive for ceiling tiles in the 1940 to 1949 Additions, and
- Drywall with joint compound in the AHU-1 and AHU-2 Mechanical Rooms.

The first additions to the school were constructed on the southern side of the Original Building between circa 1940 and 1949. Definitive information regarding dates of construction for these areas was not available during this survey. Two samples were collected of the dark brown adhesive for ceiling tiles in the 1940 to 1949 Additions. Sample No. BP181106-15 was collected from the ceiling of the Teacher's Restroom in the southeast corner of the 2nd floor, and was reported by the laboratory as "No Asbestos Detected" (NAD). Sample No. BP181106-35 was collected from the corridor just outside Room 223 and was reported by the laboratory as three percent (3%) Chrysotile asbestos. Because these materials were alike in texture and color, they are considered homogeneous. Unless additional sampling or definitive information regarding dates of construction can clearly establish separate homogeneous areas of dark brown adhesive, all dark brown adhesive in the 1940 and 1949 Additions should be considered ACM.

In addition to the materials sampled during the current survey, the school's existing Asbestos Management Plan identified several known or assumed ACMs that may be disturbed during remediation or renovations associated with moisture intrusion or water damage, including:

- White plaster ceiling in the AHU-2 Mechanical Room and assumed in other areas,
- Ceiling surfacing material in the 2nd floor storage area by the Janitor's Closet and assumed in other areas,
- Brown adhesive for ceiling tiles in the Cafeteria,
- Black seam mastic on fiberglass pipe and duct insulation,
- Mudded elbows on 2" and 4" water lines throughout the building,
- Pipe insulation on 2" pipe in corridor between Classrooms 118 and 123 and assumed in other areas,
- Thermal systems insulation (TSI) within pipe chases or above fixed ceilings (assumed ACM),
- Plaster ceiling in the Auditorium (assumed ACM), and
- Roofing materials (assumed ACM).

Please refer to the existing Asbestos Management Plan for additional information regarding ACM survey history and results within the building.

SURVEY RECOMMENDATIONS

Based on the proposed scope of demolition and renovation in the survey areas, it is assumed that the identified ACM would be damaged or impacted during demolition, and required to be appropriately removed by a licensed asbestos abatement contractor using specific engineering controls and personal protective equipment. In accordance with AHERA, an asbestos abatement specification will have to be created by an EPA accredited asbestos project designer.

A non-friable ACM is defined as any material that contains more than one percent asbestos that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. The following known or assumed asbestos-containing materials are non-friable materials as defined by NESHAP:

- Dark brown adhesive for ceiling tiles in the 1940 to 1949 Additions,
- Brown adhesive for ceiling tiles in the Cafeteria,
- Black seam mastic on fiberglass pipe and duct insulation, and
- Roofing materials (assumed ACM).

The non-friable ACM observed in the survey areas was generally in good condition; however, the adhesive is likely to delaminate and fall from wetted plaster ceilings in areas of water damage. It is expected that the non-friable material will be rendered friable during demolition; therefore, these materials should be removed prior to demolition.

A friable ACM is defined as any material containing greater than one percent asbestos that, when dry, can be crumbled, pulverized or reduced to powder with hand pressure. The following known or assumed asbestos-containing materials are friable materials as defined by NESHAP:

- Drywall with joint compound in the AHU-1 and AHU-2 Mechanical Rooms,
- White plaster ceiling in the AHU-2 Mechanical Room and assumed in other areas,
- Ceiling surfacing material in the 2nd floor storage area by the Janitor's Closet and assumed in other areas,
- Mudded elbows on 2" and 4" water lines throughout the building,
- Pipe insulation on 2" pipe in corridor between Classrooms 118 and 123 and assumed in other areas,
- Thermal systems insulation (TSI) within pipe chases or above fixed ceilings (assumed ACM),
- Plaster ceiling in the Auditorium (assumed ACM), and
- Roofing materials (assumed ACM).

The friable asbestos-containing joint compound and plaster ceilings in the Auditorium were visibly damaged by water intrusion and/or apparent mold growth during the survey. The ACM mudded elbows and pipe insulation were in good condition where observed. The reported ACM plaster ceiling in the AHU-2 Mechanical Room, ceiling surfacing material in the 2nd floor storage area, and TSI assumed in pipe chases or above fixed ceilings were not directly observed during the survey.

Any known or assumed ACM that will be impacted by renovation or remediation activities must be removed by a qualified asbestos abatement contractor prior to being impacted in accordance with all applicable EPA, OSHA, and Commonwealth of Virginia regulations. The OSHA Asbestos in Construction Standard, 29 CFR 1926.1101 requires that any contractor performing work that could impact materials containing asbestos be informed of the testing results, and must take appropriate actions to comply with the requirements of the OSHA Standard.

LIMITATIONS

Our survey was specifically focused on areas of mechanical or structural deficiencies that may be conducive or causal to water intrusion identified by the Cole & Denny survey team or directly observed during our field survey activities. It is important to note that, during our survey on November 6, precipitation was occurring and numerous active water intrusions were observed throughout the school. The active water intrusions were evidenced by freshly wetted ceiling materials throughout the school, the placement of trash cans and buckets to capture active leaks in some areas, and pooling of newly introduced flood water in the Auditorium floor. Water intrusion into the school appears to be an ongoing and widespread condition. Areas of additional water damaged materials may now be present at the school that were not observed during our field survey.

The results of our asbestos survey should not be construed as definitively inclusive of all water damaged materials, as conditions may have changed since our field survey was conducted. Additionally, Applied Environmental stresses that the asbestos sampling was extremely limited in nature and specifically targeted water damaged materials. Our asbestos survey should not be construed as a comprehensive survey completed in accordance with EPA Standards 40 CFR 763, Subpart E, AHERA. If, during the course of any planned remediation efforts, materials are anticipated to be disturbed that are not specifically documented in the school's existing Asbestos Management Plan or characterized in this survey, those materials must be sampled for laboratory analysis or assumed to contain asbestos.

If you have any questions or require further assistance, please call.

Sincerely,

Bradley C. Pearson, CIH, CHMM
Division Manager
Occupational Health and Safety

Attachments

Ref. Project no. 1064-18-0265

APPENDIX A

HOMOGENEOUS MATERIAL LIST

Homogeneous Material List

Mount Vernon Community School
2601 Commonwealth Avenue
Alexandria, Virginia 22305

Materials Sampled on November 6, 2018

Material Code	Material Description	Friable (Yes/No)	Observed Material Location	Sample Number*	Asbestos Content
PL1	Gray rough coat with white, rough textured skim coat plaster walls and ceilings	Yes	Original Building, walls and ceilings	01, 03, 04, 05, 08, 31, 32	NAD
CT1	2' x 4' white ceiling tile with dot, pinhole, and dense small gouges	Yes	1st floor, northeast corridor; 2nd floor, corridors, Room 232; and 3rd floor, corridor	02, 07	NAD
CT2	2' x 4' white ceiling tile with pinholes and sparse, skinny, serpentine fissures	No	Original Building, 2nd floor classrooms	06, 09	NAD
CT3	2' x 4' white ceiling tile with uniform dots and deep, jagged fissures	No	1940 to 1949 Additions (southern additions) – 2nd floor, corridors and Teacher Restroom	10, 11	NAD
CT4	2' x 4' white ceiling tile with uniform dots, holes, and small rounded gouges	Yes	1940 to 1949 Additions – 2nd floor, southeast corridor and Room 229	12, 13	NAD
PL2	Brown rough coat with white smooth skim coat plaster walls and ceilings	Yes	1940 to 1949 Additions, walls and ceilings	14, 33, 37, 38, 39, 44, 47, 52	NAD
AD1	**Dark brown adhesive on 1' x 1' hole grid ceiling tile**	**No**	**1940 to 1949 Additions**	**15, 35**	**3% Chrysotile**
PG1	Grayish-brown rough coat plaster/parging	Yes	Mechanical Rooms for AHU-1 and AHU-2	16, 17, 18	NAD
DJ1	**Drywall with brown paper and cream joint compound**	**Yes**	**Mechanical Rooms for AHU-1 and AHU-2**	**19, 20**	**2% Chrysotile (Joint Compound)**
SM1	Cream seam mastic on white paper wrapped yellow fiberglass pipe insulation	No	Mechanical Rooms for AHU-1 and AHU-2	21, 22	NAD
SM2	Off-white seam mastic on canvas wrapped fiberglass duct insulation	No	Mechanical Rooms for AHU-1 and AHU-2	23, 24	NAD
SM3	Cream seam mastic on canvas wrapped fiberglass duct insulation	No	Mechanical Rooms for AHU-1 and AHU-2	25, 26	NAD
AD2	Brown adhesive on 1' x 1' hole grid ceiling tile	No	Original Building	27, 28	NAD
CT5	1' x 1' hole grid ceiling tile (with AD2)	Yes	Original Building	29, 30	NAD
CT6	1' x 1' hold grid ceiling tile (with AD1)	Yes	1940 to 1949 Additions	34, 36	NAD

Homogeneous Material List

Mount Vernon Community School
2601 Commonwealth Avenue
Alexandria, Virginia 22305

Materials Sampled on November 6, 2018

Material Code	Material Description	Friable (Yes/No)	Observed Material Location	Sample Number*	Asbestos Content
DJ2	Drywall with brown paper and white joint compound at window bulkheads	Yes	New window installations	40, 45	NAD
DJ3	Drywall with dark brown paper, no joint compound	Yes	New window installations	41, 46	NAD
CT7	2' x 4' white ceiling tile with dense dots and small hole pattern	Yes	Room 221	42, 43	NAD
CM1	Tan carpet mastic	No	Auditorium	48, 49	NAD
CBM1	Brown cove base mastic	No	Auditorium	50, 51	NAD

* - All sample numbers contain the project specific prefix BP181106-
NAD = No Asbestos Detected
SF = square feet
Bold = Identified as Asbestos-Containing Material (ACM).

APPENDIX B

LABORATORY ANALYSIS REPORT

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

NVLAP Lab Code 101143-0

Chain of Custody: 612505
Client: Applied Environmental, Inc.
Address: 200 Fairbrook Drive
Suite 201
Herndon, VA 20170
Attention: Bradley Pearson

Job Name: Mt. Vernon Community School
Job Location: 2601 Commonwealth Avenue,
Alexandria, VA
Job Number: 1064-18-0265
P.O. Number: Not Provided

Date Submitted: 01/14/2019
Date Analyzed: 01/15/2019
Report Date: 01/15/2019
Date Sampled: 11/06/2018
Person Submitting: Bradley Pearson

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample Number	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
612505-1	BP181106-01	NAD	--	--	--	--	--	--	--	--	--	100	BC	Gray	Homogeneous	SC	
612505-1A	BP181106-01	NAD	--	--	--	--	--	--	--	--	--	100	PL	White	Homogeneous	SC	
612505-2	BP181106-02	NAD	--	--	--	--	10	--	40	--	--	50	CT	Multi	Layered	SC	
612505-3	BP181106-03	NAD	--	--	--	--	--	--	--	--	--	100	BC	Gray	Homogeneous	SC	
612505-3A	BP181106-03	NAD	--	--	--	--	--	--	--	--	--	100	PL	White	Homogeneous	SC	
612505-4	BP181106-04	NAD	--	--	--	--	--	--	--	--	--	100	BC	Gray	Homogeneous	SC	
612505-4A	BP181106-04	NAD	--	--	--	--	--	--	--	--	--	100	PL	White	Homogeneous	SC	
612505-5	BP181106-05	NAD	--	--	--	--	--	--	--	--	--	100	BC	Gray	Homogeneous	SC	
612505-5A	BP181106-05	NAD	--	--	--	--	--	--	--	--	--	100	PL	White	Homogeneous	SC	
612505-6	BP181106-06	NAD	--	--	--	--	70	--	--	--	--	30	CT	Multi	Layered	SC	
612505-7	BP181106-07	NAD	--	--	--	--	5	--	40	--	--	55	CT	Multi	Layered	SC	
612505-8	BP181106-08	NAD	--	--	--	--	--	--	--	--	--	100	BC	Gray	Homogeneous	SC	
612505-8A	BP181106-08	NAD	--	--	--	--	--	--	--	--	--	100	PL	White	Homogeneous	SC	
612505-9	BP181106-09	NAD	--	--	--	--	70	--	--	--	--	30	CT	Multi	Layered	SC	
612505-10	BP181106-10	NAD	--	--	--	--	30	--	40	--	--	30	CT	Multi	Layered	SC	
612505-11	BP181106-11	NAD	--	--	--	--	30	--	30	--	--	40	CT	Multi	Layered	SC	
612505-12	BP181106-12	NAD	--	--	--	--	30	--	30	--	--	40	CT	Multi	Layered	SC	
612505-13	BP181106-13	NAD	--	--	--	--	30	--	30	--	--	40	CT	Multi	Layered	SC	
612505-14	BP181106-14	NAD	--	--	--	--	--	--	--	--	--	100	BC	Gray	Homogeneous	SC	
612505-14A	BP181106-14	NAD	--	--	--	--	--	--	--	--	--	100	PL	White	Homogeneous	SW	
612505-15	BP181106-15	NAD	--	--	--	--	--	TR	--	--	TR	100	Glue	Brown	Homogeneous	SW	

AMA Analytical Services, Inc.
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Job Name: Mt. Vernon Community School
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P.O. Number: Not Provided

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612505-16	BP181106-16	NAD	--	--	--	--	--	--	--	--	--	100	PL	Gray	Homogeneous	SW	
612505-17	BP181106-17	NAD	--	--	--	--	--	--	--	--	--	100	PL	Gray	Homogeneous	SW	
612505-18	BP181106-18	NAD	--	--	--	--	--	--	--	--	--	100	PL	Multi	Homogeneous	SW	
612505-19	BP181106-19	NAD	--	--	--	--	--	--	10	--	--	90	DW	Multi	Layered	SW	
612505-19A	BP181106-19	2	2	--	--	--	--	--	TR	--	--	98	JC	Cream	Homogeneous	SW	
612505-20	BP181106-20	NAD	--	--	--	--	--	--	10	--	--	90	DW	Multi	Layered	SW	
612505-20A	BP181106-20	2	2	--	--	--	--	--	TR	--	--	98	JC	Cream	Homogeneous	SW	
612505-21	BP181106-21	NAD	--	--	--	--	TR	--	20	--	--	80	MS	Cream	Homogeneous	LBP	
612505-22	BP181106-22	NAD	--	--	--	--	TR	--	--	TR	--	100	MS	Cream	Homogeneous	LBP	
612505-23	BP181106-23	NAD	--	--	--	--	TR	--	--	--	--	100	MS	Cream	Homogeneous	LBP	
612505-24	BP181106-24	NAD	--	--	--	--	TR	--	--	--	--	100	MS	Cream	Homogeneous	LBP	
612505-25	BP181106-25	NAD	--	--	--	--	--	--	TR	--	--	100	MS	Cream	Homogeneous	LBP	
612505-26	BP181106-26	NAD	--	--	--	--	--	--	5	--	--	95	MS	Cream	Homogeneous	LBP	
612505-27	BP181106-27	NAD	--	--	--	--	--	--	TR	--	--	100	Glue	Brown	Homogeneous	LBP	
612505-28	BP181106-28	NAD	--	--	--	--	--	--	TR	--	--	100	Glue	Brown	Homogeneous	LBP	
612505-29	BP181106-29	NAD	--	--	--	--	--	--	90	--	--	10	CT	Brown	Homogeneous	LBP	
612505-30	BP181106-30	NAD	--	--	--	--	--	--	90	--	--	10	CT	Brown	Homogeneous	LBP	
612505-31	BP181106-31	NAD	--	--	--	--	--	--	--	--	--	100	BC	Brown	Homogeneous	SW	
612505-31A	BP181106-31	NAD	--	--	--	--	--	--	--	--	--	100	PL	White	Homogeneous	SW	
612505-32	BP181106-32	NAD	--	--	--	--	--	--	--	--	--	100	BC	Brown	Homogeneous	SW	

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612505-32A	BP181106-32	NAD	--	--	--	--	--	--	--	--	--	100	PL	White	Homogeneous	SW	
612505-33	BP181106-33	NAD	--	--	--	--	--	--	--	--	--	100	BC	Brown	Homogeneous	SW	
612505-34	BP181106-34	NAD	--	--	--	--	--	--	70	--	--	30	CT	Multi	Layered	SW	
612505-35	BP181106-35	3	3	--	--	--	--	--	TR	--	--	97	Glue	Brown	Homogeneous	SW	
612505-36	BP181106-36	NAD	--	--	--	--	--	--	70	--	--	30	CT	Multi	Layered	SW	
612505-37	BP181106-37	NAD	--	--	--	--	--	--	--	--	--	100	BC	Brown	Homogeneous	SW	
612505-37A	BP181106-37	NAD	--	--	--	--	--	--	--	--	--	100	PL	White	Homogeneous	SW	
612505-38	BP181106-38	NAD	--	--	--	--	--	--	--	--	--	100	BC	Brown	Homogeneous	SW	
612505-38A	BP181106-38	NAD	--	--	--	--	--	--	--	--	--	100	PL	White	Homogeneous	SW	
612505-39	BP181106-39	NAD	--	--	--	--	--	--	--	--	--	100	BC	Brown	Homogeneous	SW	
612505-39A	BP181106-39	NAD	--	--	--	--	--	--	--	--	--	100	PL	White	Homogeneous	SW	
612505-40	BP181106-40	NAD	--	--	--	--	--	--	10	--	--	90	DW	Multi	Layered	SW	
612505-40A	BP181106-40	NAD	--	--	--	--	--	--	--	--	--	100	JC	White	Homogeneous	SW	
612505-41	BP181106-41	NAD	--	--	--	--	--	--	10	--	--	90	DW	Multi	Layered	LBP	
612505-42	BP181106-42	NAD	--	--	--	--	30	--	30	--	--	40	CT	Multi	Layered	LBP	
612505-43	BP181106-43	NAD	--	--	--	--	30	--	30	--	--	40	CT	Multi	Layered	LBP	
612505-44	BP181106-44	NAD	--	--	--	--	--	--	--	--	--	100	BC	Brown	Homogeneous	LBP	
612505-44A	BP181106-44	NAD	--	--	--	--	--	--	--	--	--	100	PL	White	Homogeneous	LBP	

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Attention: Bradley Pearson

Job Name: Mt. Vernon Community School
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Job Number: 1064-18-0265
P.O. Number: Not Provided

Date Submitted: 01/14/2019
Date Analyzed: 01/15/2019
Report Date: 01/15/2019
Date Sampled: 11/06/2018
Person Submitting: Bradley Pearson

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample Number	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
612505-45	BP181106-45	NAD	--	--	--	--	--	--	10	--	--	90	DW	Multi	Layered	LBP	
612505-45A	BP181106-45	NAD	--	--	--	--	--	--	--	--	--	100	JC	White	Homogeneous	LBP	
612505-46	BP181106-46	NAD	--	--	--	--	--	--	10	--	--	90	DW	Multi	Layered	LBP	
612505-47	BP181106-47	NAD	--	--	--	--	--	--	--	--	--	100	BC	Brown	Homogeneous	LBP	
612505-47A	BP181106-47	NAD	--	--	--	--	--	--	--	--	--	100	PL	White	Homogeneous	LBP	
612505-48	BP181106-48	NAD	--	--	--	--	--	--	--	--	--	100	CM	Tan	Homogeneous	LBP	
612505-49	BP181106-49	NAD	--	--	--	--	--	--	--	--	--	100	CM	Tan	Homogeneous	LBP	
612505-50	BP181106-50	NAD	--	--	--	--	--	--	--	--	--	100	MS	Brown	Homogeneous	LBP	
612505-51	BP181106-51	NAD	--	--	--	--	--	--	--	--	--	100	MS	Brown	Homogeneous	LBP	
612505-52	BP181106-52	NAD	--	--	--	--	--	--	--	--	--	100	BC	Brown	Homogeneous	LBP	
612505-52A	BP181106-52	NAD	--	--	--	--	--	--	--	--	--	100	PL	White	Homogeneous	LBP	

AMA Analytical Services, Inc.
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Attention: Bradley Pearson

Job Name: Mt. Vernon Community School
Job Location: 2601 Commonwealth Avenue,
Alexandria, VA
Job Number: 1064-18-0265
P.O. Number: Not Provided

Date Submitted: 01/14/2019
Date Analyzed: 01/15/2019
Report Date: 01/15/2019
Date Sampled: 11/06/2018
Person Submitting: Bradley Pearson

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample Number	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

[1] TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

[2] MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993
NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

Uncertainty: For samples containing asbestos in range of 1-10% the CV is 0.43, 11-35% CV=0.55, >35 CV=0.23. All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

Analyst(s): Lom Butruk, Suphin Chinnapad, Surat Watson

Technical Director Michael Greenberg

OWI (410) 247-2024 159202 210 REV. 6.08

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 612505

Mailing/Billing Information:
1. Client Name: Applied Environmental, Inc.
2. Address 1: 200 Fairbrook Drive
3. Address 2: Suite 201
4. Address 3: Herndon, Virginia 20170
5. Phone #: 703-648-0822 Fax #: 703-648-0575

Submittal Information:
1. Job Name: Mt. Vernon Community School
2. Job Location: 2601 Commonwealth Avenue, Alexandria, VA
3. Job #: 1064-18-0265 P.O. #:
4. Contact Person: Bradley Pearson @ phone # 703-648-0822
5. Submitted by: Bradley Pearson Signature: [signature] 1/11/2019

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due: ☐ 24 Hours Time Due: Comments:	☐ Immediate ☒ Next Day ☐ 2 Day ☐ 3 Day ☐ 5 Day + Date Due: 1/15/19 ☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)	☐ Include COC/Field Data Sheets with Report ☒ Email: bpearson@appenv.com@ osharif@appenv.com ☐ Fax: ☐ Verbals:

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
- ☐ NIOSH 7400 ____ (QTY)
- ☐ Fiberglass ____ (QTY)

TEM Air – Please Indicate Filter Type:
- ☐ AHERA ____ (QTY)
- ☐ NIOSH 7402 ____ (QTY)
- ☐ Other (specify ____) ____ (QTY)

PLM Bulk
- ☒ EPA 600 – Visual Estimate 52 (QTY)
- ☐ EPA Point Count ____ (QTY)
- ☐ NY State Friable 198.1 ____ (QTY)
- ☐ Grav. Reduction ELAP 198.6 ____ (QTY)
- ☐ Other (specify ____) ____ (QTY)

MISC
- ☐ Vermiculite
- ☐ Asbestos Soil PLM__(Qual) PLM__(Quan) PLM/TEM__(Qual) PLM/TEM__(Quan)

TEM Bulk
- ☐ ELAP 198.4/Chatfield ____ (QTY)
- ☐ NY State PLM/TEM ____ (QTY)
- ☐ Residual Ash ____ (QTY)

TEM Dust
- ☐ Qual. (pres/abs) Vacuum/Dust ____ (QTY)
- ☐ Quan. (s/area) Vacuum D5755-95 ____ (QTY)
- ☐ Quan. (s/area)Dust D6480-99 ____ (QTY)

TEM Water
- ☐ Qual. (pres/abs) ____ (QTY)
- ☐ ELAP 198.2/EPA 100.2 ____ (QTY)
- ☐ EPA 100.1 ____ (QTY)

☑ All samples received in good condition unless otherwise noted. (TEM Water samples ____ °C)

Metals Analysis
- ☐ Pb Paint Chip ____ (QTY)
- ☐ Pb Dust Wipe (wipe type ____) ____ (QTY)
- ☐ Pb Air ____ (QTY)
- ☐ Pb Soil/Solid ____ (QTY)
- ☐ Pb TCLP ____ (QTY)
- ☐ Drinking Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
- ☐ Waste Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
- ☐ Pb Furnace (Media ____) ____ (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media
- ☐ Spore-Trap ____ (QTY)
- ☐ Surface Swab ____ (QTY)
- ☐ Surface Tape ____ (QTY)
- ☐ Other (Specify ____) ____ (QTY)
- ☐ Surface Vacuum Dust ____ (QTY)
- ☐ Culturable ID Genus (Media ____) ____ (QTY)
- ☐ Culturable ID Species (Media ____) ____ (QTY)

CLIENT ID NUMBER	SAMPLE INFORMATION SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS TEM	PCM	PLM	LEAD	MOLD	MATRIX AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
BP181106-01 to -52	See attached	11/6/18					xx				xx					

CLIENT CONTACT (LABORATORY STAFF ONLY)

Date/Time: Contact: By:
Date/Time: Contact: By:
Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: 1/14/19 @1030 Via: FedEx By (Print): [signature] Sign: [signature]
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments:

Applied Environmental, Inc.

Chain of Custody - Mt. Vernon Community School
Sample Identification

Project No.
1064-18-0265

Material Code	Material Description	Sample Number BP181106-
PL1	Gray rough coat with white, rough textured skim coat plaster walls and ceilings	01, 03, 04, 05, 08, 31, 32
CT1	2. x 4. white ceiling tile with dot, pinhole, and dense small gouges	02, 07
CT2	2' x 4' white ceiling tile with pinholes and sparse, skinny, serpentine fissures	06, 09
CT3	2' x 4' white ceiling tile with uniform dots and deep, jagged fissures	10, 11
CT4	2' x 4' white ceiling tile with uniform dots, holes, and small rounded gouges	12, 13
PL2	Brown rough coat wiwth white smooth skim coat plaster walls and ceilings	14, 33, 37, 38, 39, 44, 47, 52
AD1	Dark brown glue dots on 1' x 1' hole grid ceiling tile	15, 35
PG1	Grayish-brown rough coat plaster/parging	16, 17, 18
DJ1	Drywall with brown paper and cream joint compound	19, 20
SM1	Cream seam mastic on white paper wrapped yellow fiberglass pipe insulation	21, 22
SM2	Off-white seam mastic on canvas wrapped fiberglass duct insulation	23, 24
SM3	Cream seam mastic on canvas wrapped fiberglass duct insulation	25, 26
AD2	Brown glue dots on 1' x 1' hole grid ceiling tile	27, 28
CT5	1' x 1' hole grid ceiling tile (with AD2)	29, 30
CT6	1' x 1' hold grid ceiling tile (with AD1)	34, 36
DJ2	Drywall with brown paper and white joint compound at window bulkheads	40, 45
DJ3	Drywall with dark brown paper, no joint compound	41, 46
CT7	2' x 4' white ceiling tile with dense dots and small hole pattern	42, 43
CM1	Tan carpet mastic	48, 49
CBM1	Brown cove base mastic	50, 51

Samples collected: September 28, 2018

DOWNEY & SCOTT, LLC
Construction Management Services

Main Office: 6799 Kennedy Road Unit F Warrenton, Virginia 20187 Phone: 540.347.5001 Fax: 540.347.5021
1388 NW 2nd Ave., Unit 4B, Boca Raton, FL. 33432 Phone: 561.416.1240 Fax: 561.416.1248 www.downeyscott.com

Study
Cost Estimate Report

Report Date November 26, 2018
Revision Date November 27, 2018

Prepared for:

Cole & Denny

Cole&DennyArchitects

Mt. Vernon Community School
Water Intrusion Assessment
Alexandria, VA

COST ESTIMATE CLARIFYING NOTES & EXCLUSIONS

- We have incorporated construction costs for a single Contractor procurement via lump sum General Contract for non-phased construction.
- Without exception, we have included hard construction costs only and all soft construction costs are excluded. Please refer to list of Owner Budget Items.
- The Limits of Construction are those indicated on the documents provided.
- We have included and allowance for Mold remediation costs. Lead Paint, Asbestos, PCB's remediation costs are **not** included in our analysis.
- Design Contingency accounts for the costs of yet unidentified scope requirements. A Design Contingency has been included in the amount indicated in the project summary.
- Construction Contingency accounts for the costs of change orders. A Construction Contingency has not been included. We recommend that the owner carry an additional 3-5% Construction Contingency for unforeseen conditions.
- Escalation accounts for the inflationary effects of elapsed time. Escalation costs have been included to the project mid-point in the amount indicated in the project summary.
- Our costs do not include any Owner Furniture storage or moving costs.
- All cost data is based on Open Shop Wages and burden rates.

MARKET CONDITIONS & OPINIONS OF PROBABLE COST

Downey and Scott, LLC has no control over market conditions or acts of God that can create rapid fluctuations in material prices. We have extensive experience in similar projects and have employed our best judgment in analyzing the subject project. We cannot, however, guarantee that actual construction costs will not vary from the opinions of probable construction costs herein provided.

Please contact D. Daigle, CVS, CPE – Vice President regarding this project should you have any questions or concerns.

Revision 1

Report: Feasibilty Study	*Prepared by: Downey & Scott, LLC*	Status: Assessment	PM: ja/ct
Project: Mount Vernon Community School	*6799 Kennedy Road, Suite F*	Client: Cole & Denny Architects	Chckd by: dd/sm
Location: Alexandria, Virginia	*Warrenton, Virginia 20187*	Submission: November 26, 2018	Job no: 18178
Documents Received: Novemeber 19, 2018	*Ph 540.347.5001 Fax 540.347.5021*	Run Date: See footer	
	www.downeyscott.com	Revision Date: November 27, 2018	

LOC REF	SYS #	UNIFORMAT SYSTEM	SPECIFICATION	QUANTITY	U/M	UNIT COST	EXTENSION

PROJECT HARD CONSTRUCTION COST SUMMARY

HARD CONSTRUCTION COSTS		**112,730 GSF**		
			Cost per SF	
WATER INTRUSION REPAIRS		**112,730 GSF**	***$78.32***	**8,829,286**
SUBTOTAL	**SUBTOTAL**			**8,829,286**
ESCALATION TO MIDPOINT	**ASSUMED START DATE JUNE 2019**	**4.17%**		**367,887**
SUBTOTAL	**SUBTOTAL**			**9,197,173**
DESIGN CONTINGENCY	**CONTINGENCY**	**20.00%**		**1,839,435**
SUBTOTAL	**SUBTOTAL**			**11,036,608**
			Cost per SF	
	PROJECT TOTAL		***$97.90***	***$11,036,608***
ALTERNATE				
Modify Existing HVAC System	breakdown below		***DEDUCT***	***-$2,496,703***

Revision 1

Report:	**Feasibilty Study**	**Status:**	**Assessment**
Project:	**Mount Vernon Community School**	**Client:**	**Cole & Denny Architects**
Location:	**Alexandria, Virginia**	**Submission:**	**November 26, 2018**
Documents Received:	**Novemeber 19, 2018**	**Run Date:**	**See footer**
		Revision Date:	**November 27, 2018**

Prepared by: Downey & Scott, LLC
6799 Kennedy Road, Suite F
Warrenton, Virginia 20187
Ph 540.347.5001 Fax 540.347.5021
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PM: ja/ct
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Job no: 18178

112,730 GSF

LOC REF	SYS #	UNIFORMAT SYSTEM	SPECIFICATION	QUANTITY	U/M	UNIT COST	EXTENSION
		SELECT BLDG. DEMO & SITEWORK	Temp Protection & temp cleaning	1.00	LS	7,200.00	7,200.00
			Demo Ceilings	13,910.00	SF	1.22	16,970.20
			Demo Interior side of exterior walls	16,476.00	SF	1.78	29,327.28
			Disposal	168.81	CY	42.00	7,090.07
			Hazmat/Mold abatement - Allowance	1.00	LS	62,595.00	62,595.00
			New building drain loop & tie-ins	1,995	LF	65.00	129,675.00
			Misc. Site Repairs - Allowance	1	LS	28,000.00	28,000.00
		EXTERIOR CLOSURE	Masonry repairs, Point up and cleaning	53,676.00	SF	5.50	295,218.00
			Air barrier & Insulation	16,476.00	SF	7.80	128,512.80
			Reset windows w/ sills & heads	1.00	LS	24,800.00	24,800.00
		ROOFING	Flashing	2,836.50	SF	7.56	21,443.94
			Misc. Roof repairs/cap at HVAC modifications	1.00	LS	4,500.00	4,500.00
			Roof Replacement			Not Included	
		INTERIOR CONST	Interior GWB walls	16,476.00	SF	8.20	135,103.20
			GWB patching, misc	1.00	LS	14,200.00	14,200.00
			New 2x2 ACT Ceilings	13,910.00	SF	4.25	59,117.50
			Ceiling repairs/replacement at HVAC Modifications	112,730.00	GSF	0.78	87,929.40
			Rubber base	1,361.00	LF	3.10	4,219.10
			Paint New GWB walls	16,476.00	SF	1.12	18,453.12

Revision 1

Report:	**Feasibilty Study**	**Status:**	**Assessment**
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Documents Received:	**Novemeber 19, 2018**	**Run Date:**	**See footer**
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LOC REF	SYS #	UNIFORMAT SYSTEM	SPECIFICATION	QUANTITY	U/M	UNIT COST	EXTENSION
		MECHANICAL HVAC	Equipment	112,730.00	GSF	17.50	1,972,775.00
		New VRF System with DOAS & RTU	Piping & Valves	112,730.00	GSF	6.05	682,016.50
			Ductwork	112,730.00	GSF	7.20	811,656.00
			Air Outlets	112,730.00	GSF	0.55	62,001.50
			Misc Ductwork Accessories	112,730.00	GSF	0.70	78,911.00
			Temperature Controls	112,730.00	GSF	4.95	558,013.50
			Air & Water Balance	112,730.00	GSF	0.35	39,455.50
			Insulation	112,730.00	GSF	2.35	264,915.50
			Demolition	112,730.00	GSF	1.50	169,095.00
			Coordination Drawings	112,730.00	GSF	0.30	33,819.00
		PLUMBING	Storm Piping/Roff Drains	112,730.00	GSF	1.25	140,912.50
			Insulation - horizontal piping only	112,730.00	GSF	0.68	76,656.40
		ELECTRICAL	Cabinets & Enclosures (safety switches)	112,730.00	GSF	0.98	110,475.40
		Power Wiring for New HVAC Systems	Power Home Runs	112,730.00	GSF	3.50	394,555.00
			Power Branch	112,730.00	GSF	2.10	236,733.00
			Demolition	112,730.00	GSF	1.00	112,730.00
			Coordination Drawings	112,730.00	GSF	0.30	33,819.00
		MARK-UPS	Subtotal				6,852,894.41
			General Conditions	15.00%			1,027,934.16
			Subtotal				7,880,828.57
			GC OH @ 5% plus Profit @ 5%	10.00%			788,082.86
			Subtotal				8,668,911.42
			Bonds & insurance	1.85%			160,374.86
			Subtotal	112,730.00	**GSF**	**$78.32**	**8,829,286.29**

Revision 1

Report:	**Feasibilty Study**	***Prepared by: Downey & Scott, LLC***	**Status:**	**Assessment**	**PM: ja/ct**
Project:	**Mount Vernon Community School**	***6799 Kennedy Road, Suite F***	**Client:**	**Cole & Denny Architects**	**Chckd by: dd/sm**
Location:	**Alexandria, Virginia**	***Warrenton, Virginia 20187***	**Submission:**	**November 26, 2018**	**Job no: 18178**
Documents Received:	**Novemeber 19, 2018**	***Ph 540.347.5001 Fax 540.347.5021***	**Run Date:**	**See footer**	
		www.downeyscott.com	**Revision Date:**	**November 27, 2018**	

LOC REF	SYS #	UNIFORMAT SYSTEM	SPECIFICATION	QUANTITY	U/M	UNIT COST	EXTENSION
		MODIFY EXISTING HVAC SYSTEM - OPTION 1					
NEW VRF SYSTEM		**MECHANICAL HVAC**	Equipment	112,730.00	GSF	17.50	1,972,775.00
NEW VRF SYSTEM		**New VRF System with DOAS & RTU**	Piping & Valves	112,730.00	GSF	6.05	682,016.50
NEW VRF SYSTEM			Ductwork	112,730.00	GSF	7.20	811,656.00
NEW VRF SYSTEM			Air Outlets	112,730.00	GSF	0.55	62,001.50
NEW VRF SYSTEM			Misc Ductwork Accessories	112,730.00	GSF	0.70	78,911.00
NEW VRF SYSTEM			Temperature Controls	112,730.00	GSF	4.95	558,013.50
NEW VRF SYSTEM			Air & Water Balance	112,730.00	GSF	0.35	39,455.50
NEW VRF SYSTEM			Insulation	112,730.00	GSF	2.35	264,915.50
NEW VRF SYSTEM			Demolition	112,730.00	GSF	1.50	169,095.00
NEW VRF SYSTEM			Coordination Drawings	112,730.00	GSF	0.30	33,819.00
NEW VRF SYSTEM							
NEW VRF SYSTEM		**PLUMBING**	Storm Piping/Roff Drains	112,730.00	GSF	1.25	140,912.50
NEW VRF SYSTEM			Insulation - horizontal piping only	112,730.00	GSF	0.68	76,656.40
NEW VRF SYSTEM							
NEW VRF SYSTEM		**ELECTRICAL**	Cabinets & Enclosures (safety switches)	112,730.00	GSF	0.98	110,475.40
NEW VRF SYSTEM		**Power Wiring for New HVAC Systems**	Power Home Runs	112,730.00	GSF	3.50	394,555.00
NEW VRF SYSTEM			Power Branch	112,730.00	GSF	2.10	236,733.00
NEW VRF SYSTEM			Demolition	112,730.00	GSF	1.00	112,730.00
NEW VRF SYSTEM			Coordination Drawings	112,730.00	GSF	0.30	33,819.00
NEW VRF SYSTEM							
NEW VRF SYSTEM							
		MARK-UPS	Subtotal				5,778,539.80
			General Conditions	15.00%			866,780.97
			Subtotal				6,645,320.77
			GC OH @ 5% plus Profit @ 5%	10.00%			664,532.08
			Subtotal				7,309,852.85
			Bonds & insurance	1.85%			135,232.28
			Total	112,730.00	GSF	$66.04	7,445,085.12

Revision 1

Report:	**Feasibilty Study**	**Status:**	**Assessment**
Project:	**Mount Vernon Community School**	**Client:**	**Cole & Denny Architects**
Location:	**Alexandria, Virginia**	**Submission:**	**November 26, 2018**
Documents Received:	**Novemeber 19, 2018**	**Run Date:**	**See footer**
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LOC REF	SYS #	UNIFORMAT SYSTEM	SPECIFICATION	QUANTITY	U/M	UNIT COST	EXTENSION
		MODIFY EXISTING HVAC SYSTEM - OPTION 2					
MODIFY EXISTING SYSTEM		MECHANICAL HVAC	Equipment	112,730.00	GSF	9.50	1,070,935.00
MODIFY EXISTING SYSTEM		Modify Existing 2-Pipe System	Piping & Valves	112,730.00	GSF	3.50	394,555.00
MODIFY EXISTING SYSTEM			Ductwork	112,730.00	GSF	6.00	676,380.00
MODIFY EXISTING SYSTEM			Air Outlets	112,730.00	GSF	0.55	62,001.50
MODIFY EXISTING SYSTEM			Misc Ductwork Accessories	112,730.00	GSF	0.25	28,182.50
MODIFY EXISTING SYSTEM			Temperature Controls	112,730.00	GSF	4.95	558,013.50
MODIFY EXISTING SYSTEM			Air & Water Balance	112,730.00	GSF	0.35	39,455.50
MODIFY EXISTING SYSTEM			Insulation	112,730.00	GSF	2.35	264,915.50
MODIFY EXISTING SYSTEM			Demolition	112,730.00	GSF	1.25	140,912.50
MODIFY EXISTING SYSTEM			Coordination Drawings	112,730.00	GSF	0.30	33,819.00
MODIFY EXISTING SYSTEM							
MODIFY EXISTING SYSTEM		PLUMBING	Storm Piping/Roff Drains	112,730.00	GSF	1.25	140,912.50
MODIFY EXISTING SYSTEM			Insulation - horizontal piping only	112,730.00	GSF	0.68	76,656.40
MODIFY EXISTING SYSTEM							
MODIFY EXISTING SYSTEM		ELECTRICAL	Cabinets & Enclosures (safety switches)	112,730.00	GSF	0.30	33,819.00
MODIFY EXISTING SYSTEM		Power Wiring for New HVAC Systems	Power Home Runs	112,730.00	GSF	1.25	140,912.50
MODIFY EXISTING SYSTEM			Power Branch	112,730.00	GSF	0.95	107,093.50
MODIFY EXISTING SYSTEM			Demolition	112,730.00	GSF	0.34	38,328.20
MODIFY EXISTING SYSTEM			Coordination Drawings	112,730.00	GSF	0.30	33,819.00
MODIFY EXISTING SYSTEM							
MODIFY EXISTING SYSTEM		***TOTAL***					
		MARK-UPS	Subtotal				3,840,711.10
			General Conditions	15.00%			576,106.67
			Subtotal				4,416,817.77
			GC OH @ 5% plus Profit @ 5%	10.00%			441,681.78
			Subtotal				4,858,499.54
			Bonds & insurance	1.85%			89,882.24
			Subtotal	112,730.00	**GSF**	**$43.90**	**4,948,381.78**