Feasibility Study
Piney Branch Elementary School

Prepared for:

Montgomery County Public Schools

Prepared by:

Stantec

Stantec Architecture Ltd. July 17, 2025

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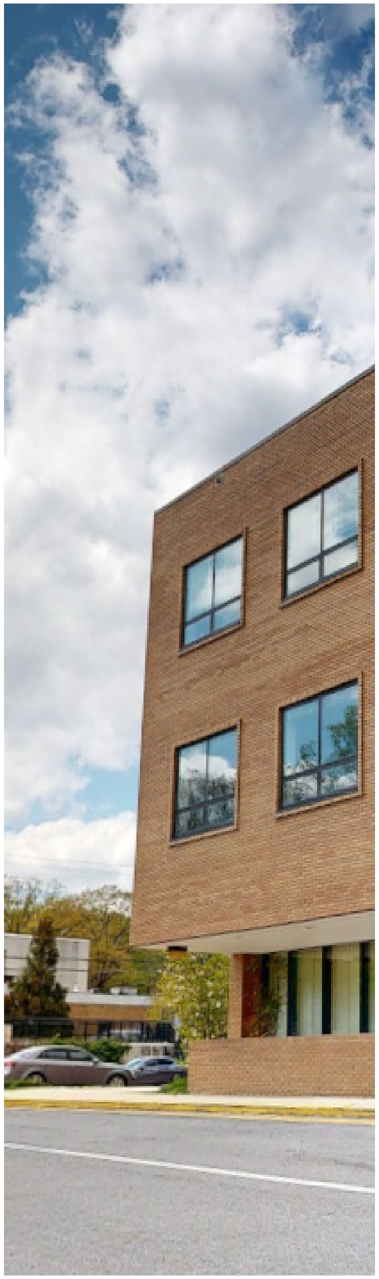

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Piney Branch Elementary School

Feasibility Study

7510 Maple Ave,
Takoma Park, MD 20912

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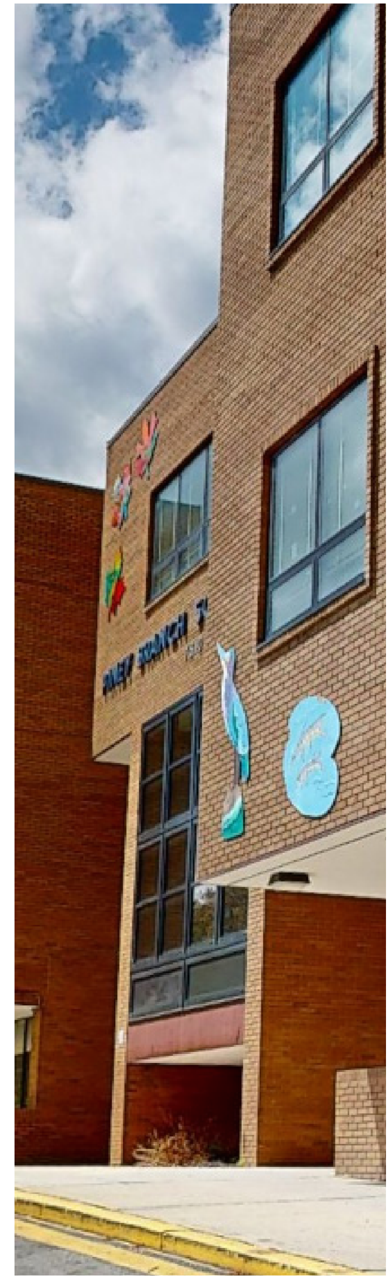

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PINEY BRANCH SCHOOL

Introduction

The feasibility study for Piney Branch Elementary School (PBES) was conducted for Montgomery County Public Schools (MCPS) by the architectural firm, Stantec Architecture Inc. PBES is located at 7510 Maple Avenue, Takoma Park, Maryland 20912 and is included in the Downcounty Consortium. The study was developed under the direction of the MCPS Department of Planning and Construction.

Feasibility Study Participants

The feasibility study participants attended the following community engagement meetings held for PBES.

- April 23: City of Takoma Park meeting
- May 1: Community meeting #1
- May 13: Community (staff) meeting
- May 15: Community meeting #2
- May 29: Community meeting #3
- June 4: Community meeting #4
- June 30: Community meeting #5
- July 23: City of Takoma Park Presentation

Participants

- Jim Douglas — Resident
- Mark Fisher — Neighbor
- Patty First — Neighbor
- Kurt Gilbert — Council Member
- Prisilla Labovitz — Board Member
- Lisa Kiey — Resident
- Theresa Gibson — Resident
- Denise Jones — Resident
- Jessica Landman — City Council
- John Gavin
- Julie Morris — MCPS Staff
- Jack Gillum — Parent
- Claire Hudson — Resident/Swimmer
- Raphael Gaines — Resident
- Ken Flemmer — Resident
- Wayne Sherwood — Neighbor
- Sue Miller — Former PTA President
- Carrie Headen — MoCo Rec
- Peter Munger — Neighbor
- Rebecca Sutton — TPES Parent
- Sylvie Shaffer — Neighbor
- Hilary Stevens — Parent/Swimmer
- Marcelle Fozard — Neighbor
- JoAnne Murray — MSDE Office of School Facilities
- Budd Daniels — Former Pool Manager
- David Montgomery — Parent
- Edwardo Leiman — Parent
- Tony Castleman — Neighbor/Parent
- Lynn Bau Meister — Swimmer
- Talisha S. — City Official
- Elizabeth Wallace — Resident
- Elana Oleinick — General Music
- Justine Li — 4th Grade Teacher
- Renee Luker — 5th Grade Teacher
- Spencer Madison — 5th Grade Teacher
- Akossiwa Lawrence — Special Education
- Jave Robinson — SDT

Participants (Continued)

- Krishni Patrick — Teacher
- Erica Cantu — Art Teacher
- Fanta Kandeh — Teacher
- Anna Flynn — Instrument Teacher
- Christina Davidson — 3rd Grade Tacher
- Samantha Gazda — 3rd Grade Teacher
- Sarah Casey — 4th Grade Teacher
- Robyn Berardi — 4th Grade Teacher
- Laura Eskow — 4th Grade Teacher
- Soosan Faulk — Math Focus Teacher
- Rory Joy — Special Ed Teacher
- Brandi Giles — 3rd Grade Teacher
- Erika Granados — 3rd Grade Teacher
- Dion Young — 3rd Grade Teacher
- Kristen Dunlap-Roberts — 3rd Grade Teacher
- Crystal Brooking — 5th Grade Teacher
- Katherine Kirsch — ELD Teacher
- Harper Deaherd — ELD Teacher
- Rasheeda Pinnock — Teacher
- Cailey Tolson — 5th Grade Teacher
- Meave Kenney — Teacher
- Beth Novey — Parent
- Roz Grizby — City Staff
- Jack Gillum — Parent
- Jim Kariya — Pool User
- Maren Farris — Parent
- James Saxon — Future Parent
- Nicole Ferraiolo — Parent
- Matthew Hamilton — Parent
- Madeline Schomburg — Parent
- Sharon Gaines — Parent
- Henry Scott — Student
- Katie Scott — Parent
- Nini Aldrighetti — Parent
- Laurel Duff — Future Parent
- Joe Ryan — Neighbor
- Paul Landefeld — Parent
- Andrew Schide — Parent
- John Gavin — ACSBW
- Tony Castleman — Parent/Pool User
- Ben Rinehart — MCPS Parent
- Andy Kachor — Future Parent
- Rebecca Correll — Parent
- David Bend — Parent
- Steve Fisher — Parent
- Kierstin Quinsland — Parent
- Hilary Stevens — Parent/Pool User
- Brandi Giles — Teacher
- Erika Granados — Teacher
- Adam Smith — Pool User
- Elizabeth Walce — Neighbor
- Christine Dobridge — Parent
- Julie Morris — MCPS Staff
- Zoey Morris — Student
- Andrea Green — Parent
- Katie Ruffing — Parent
- Mark Fisher — Neighbor
- Dan Suzman — Parent
- Ary A. — Parent
- Shawna Fachet — Rec. Dept.
- Soosan Faulk — MCPS Staff/Parent
- Jessica Gillstrom — Parent
- Andrew Marcus — Parent
- Vayne Sherwood — Neighbor/Pool User
- Mei Kong — Nighbor/Pool User
- Perry Sacks — Parent
- Rebecca Sutton — Parent
- Philip Kifolas — Neighbor/Pool User
- Caroline Barrett — Parent
- Diana Kohn — Parent/PTA
- Roger Schlegel — City Council Member
- Marc Boom — Parent
- Jill Westheim — Parent
- Cortney Palmielo — Parent
- Juli Carver — Aftercare Rep.
- Alison Snyder — Parent
- Shane Weckesser — Parent
- Lauren Henry — Parent
- Nate Perkins — Parent
- Jessica Landman — Council Member
- Sarah Jane Marcus — Parent
- Seth Shames — Parent
- Victoria Muten — Parent
- Tamar Greenspan — Parent
- Julie O. — Parent
- Theresa Gibson — Community
- Steve Whitney — Community
- Emily Adams — (DCPS)
- Krysia Avila
- Brian Schwartz
- Catherine R.
- Christina Davidson
- Ingrid Gardiner
- Heimy Salgado
- Jillian Storms
- Jo Anne Murray
- Courtney Jones
- Kate F
- Kate Lofgren
- Katherine Kirsch
- Monica Konschnik
- Shane W
- Spencer Cantrell

Purpose

The purpose of this feasibility study is to determine the most effective, efficient, and affordable ways to accommodate the educational specifications requirements for Piney Branch Elementary School while improving:

- Safety and security,
- Instruction and delivery,
- Occupant health and well-being,
- Site and building accessibility,
- Operational efficiency and effectiveness.

When completed, the facility will have an increased capacity of 644, with core spaces designed for 640 students.

Background Information

Piney Branch Elementary School opened in 1971. Due to site constraints, the school was designed as a split-level three story school to fit on the small parcel of land. The design of the school incorporated an "open plan" where each large classroom accommodated 4 teachers (and their students) without dividing walls. Another unique feature of this school was the integration of public health and social services and a swimming pool into the building. The result was a school that provided instructional spaces for students, as well as recreational, social and health services for the community. Today, the school serves as a grade 3-5 paired school with Takoma Park Elementary School.

Since the school was built, there have been three renovations that have led to the sub-division of the larger classrooms, elimination of the "open plan" designs, changes to the heating and cooling systems and the addition of windows.

While the building no longer provides the health programs it once did, it remains a beacon for the community. One important recreational facility that remains housed in the school is the swimming pool which is used by the community and PBES to provide water safety classes for the students. The pool and the associated locker rooms are accessible from inside the school, which presents security concerns. As a result, pool use by the community is limited to after school hours.

History and Square Footage of Existing Building:

1971	Original Construction	102,461 SF
Total:		102,461 SF

Current and Projected School Capacity and Student Enrollment:

	Actual	Projections					
	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031
Program Capacity	621	621	621	621	621	621	621
Enrollment	575	572	601	568	544	503	527
Space Available/Deficit	-46	-49	-20	-53	-77	-118	-94

Methodology

The feasibility study was developed through a design process that included:

Review of As-Built Drawings:

The A/E team reviewed the existing conditions documentation provided by MCPS. These documents primarily consisted of architectural plans. No structural documentation was available.

Survey and analysis of the existing building:

The existing school was surveyed and evaluated by a team of architects and engineers to gain a better understanding of the existing conditions, as well as the opportunities and challenges inherent in the existing facility that would aid in the development of the design concepts.

The design team utilized Matterport to take 3D scans of the entire building, documenting existing conditions, both visually and dimensionally.

Educational Specifications:

Review of the educational specifications dated February 20, 2025 provided by MCPS.

Community Engagement Meetings

There were six meetings held with the community. The community was represented by MCPS staff, City of Takoma Park Government, PBES Staff, and members of the community. During these meetings, the design team documented feedback received on the challenges with the existing building, the opportunities a new building would provide and feedback on the design options presented. Below is a summary of the feedback received:

Challenges:

- Accessible Access to Playground
- Accessible Access throughout building
- Combined Bus and Parent Drop off
- Unreliable heating / cooling systems
- Roof leaks
- Monitoring students / security

Opportunities:

- Outdoor space for community
- Safer Pedestrian Site Circulation
- Safer Drop-off / Pick-up
- Natural Light in All Classrooms
- Library as Heart of the School
- More Efficient Mechanical Systems

Design Options:

- Strong preference for options that include the pool.

In addition to the above topics, the community raised concerns regarding the location of potential holding centers that would be required to modernize PBES and bus transportation during construction.

Overview

Four options were developed and refined with input from feasibility study participants. While a swimming pool is not included in the Educational Specifications for PBES, MCPS requested the design team explore each option with and without a pool.

- Option 1a/1b explores reusing the existing building with major renovations limited to within the existing building footprint.
- Option 2a/2b explores expanding the building footprint by incorporating small additions (less than 50% of the building area) with major renovations.
- Options 3a/3b explores expanding the building footprint by incorporating large additions (greater than 50% of the building area) with major renovations.
- Options 4a/4b explores building a new building on the existing site.

Detailed descriptions and cost estimates of each option have been provided in the Description of Options section of this report.

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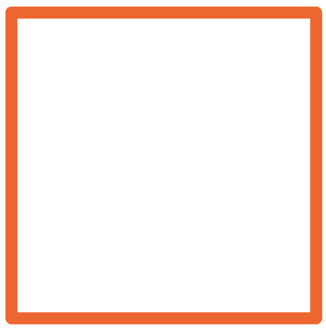
Design Options

1.



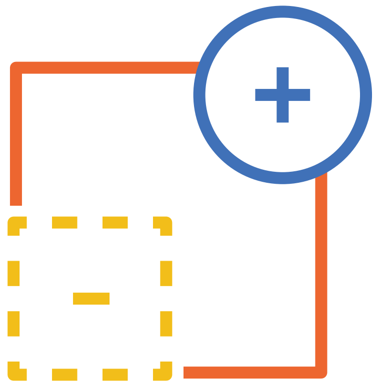
Renovation
No Demolition
No Addition

- Code Compliance
- Spec Compliance
- Systems Upgrades
- Security Upgrades

1a. With Pool

1b. Without Pool

2.



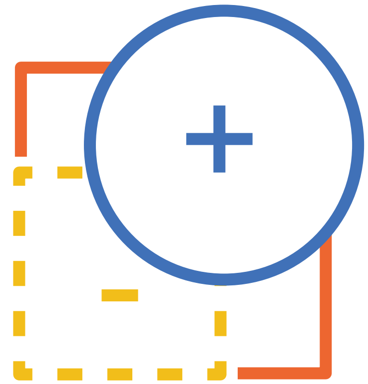
Renovation
<50% Demolition
Small Addition

- Code Compliance
- Spec Compliance
- Systems Upgrades
- Security Upgrades

1a. With Pool

1b. Without Pool

3.



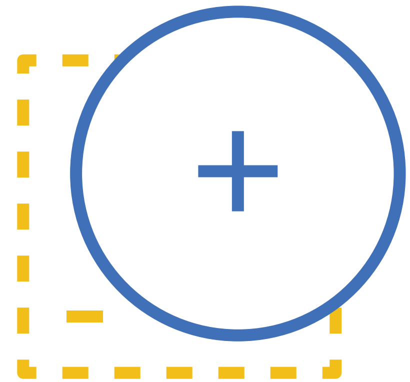
Renovation
>50% Demolition
Large Addition

- Code Compliance
- Spec Compliance
- Systems Upgrades
- Security Upgrades

1a. With Pool

1b. Without Pool

4.



No Renovation
Complete Demolition
New School

- Code Compliance
- Spec Compliance
- Systems Upgrades
- Security Upgrades

1a. With Pool

1b. Without Pool

Option 1a

Renovation
No Demolition
No Addition

With Pool

Option 1a strives to meet the Educational Specification requirements through a complete renovation of the building interior, exterior, and site. All building systems will be replaced with structure and vertical circulation remaining in place. New roofing, windows, fire protection, plumbing, HVAC, electrical, lighting, fire detection, AV, security, and technology systems will be installed. The building and site will meet local code and accessibility requirements.

A complete renovation will allow for a safer drop-off and improved interior circulation, accessibility, and learning environments. Given the constraints of the existing building footprint and site some classrooms will remain undersized and lack access to daylight, the playground will remain inaccessible, and the parking count won't meet the Educational Specification requirements.

The pool will be maintained. Its pump and filtration systems will be replaced.

Option 1b

Renovation
No Demolition
No Addition

Without Pool

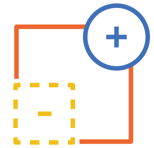
Option 1b is similar to Option 1a. There will be a complete renovation of the building and site along with a replacement of building systems. Structure and vertical circulation will remain in place. Option 1b differs in that it eliminates the pool function, utilizes the space for the multi-purpose room, and allows for the music and art program to meet square footage and adjacency Educational Specification requirements.

Option 1b contends with the same building and site constraints as Option 1a. While it achieves a safer drop-off and improved learning environments some classrooms will remain undersized and lack access to daylight, the park will remain inaccessible, and the parking count will not meet the Educational Specification requirements.

Option 2a

Renovation
Small Demolition
Small Addition

With Pool



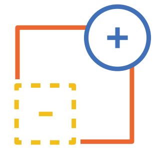
Option 2a strives to meet the Educational Specification requirements through a complete renovation and several small additions along the building perimeter which allow all classrooms access to natural light and establishes an accessible route to the park. All building systems will be replaced and the interior split level will be removed allowing the library to drop to the first floor and become the heart of the school.

These changes will allow the scheme to meet the minimum Educational Specification requirements except for the parking count.

Option 2b

Renovation
Small Demolition
Small Addition

Without Pool



Option 2b is similar to Option 2a. There will be a complete renovation, small additions, and the elimination of the split level. Option 2b differs in that it eliminates the pool and utilizes the space for the multipurpose room while allowing for the music and art program to meet Educational Specification adjacency requirements. By dropping the music and art program down to the first floor, there is enough room on the upper floors to establish well balanced educational communities each containing centralized support and collaboration spaces.

Option 2b meets all Educational Specification requirements except for the parking count.

Option 3a

Renovation
Large Demolition
Large Addition
With Pool

Option 3a strives to meet Educational Specification requirements through the demolition of all but the pool and gym, reducing the building's footprint by building back next to and over top of the two spaces. Although it was not pursued for this option, this significant demolition creates enough room on the site to achieve the Educational Specification required parking count. The demolition also allows for the placement of the multipurpose room and library at the heart of the school with direct access to outdoor learning spaces that connect to the park. Educational communities are established at the upper floors and have direct access to outdoor learning and the park.

Option 3a meets all Educational Specification requirements except for the parking count. To maintain the pool and meet the program requirements four levels will be needed.

Option 3b

Renovation
Large Demolition
Large Addition

Without Pool

Option 3b is similar to 3a in its demolition and build-back approach, but it eliminates the pool, reduces the building to three levels, and meets all Educational Specification requirements.

While Option 3b is similar to Option 3a in the scope of demolition and build-back approach, it eliminates the pool. This results in a three level building that meets all Educational Specification requirements, including the 80 required parking spaces.

Option 4a

No Renovation
Complete Demolition
New School

With Pool

Option 4a efficiently meets Educational Specification requirements by demolishing the existing building and building a new facility next to the park. The proximity to the park allows for a direct, accessible connection. Rotating a portion of the building 90 degrees allows for a greater presence on Maple Ave. As with earlier schemes, the library is the heart of the school. Potentially stacked above the library could be an outdoor learning courtyard connecting the building to park.

This option includes a new pool that can be completely separated from the school, allowing the community to utilize the pool during school hours.

Option 4a meets all Educational Specification requirements except for the parking count.

Option 4b

No Renovation
Complete Demolition
New School

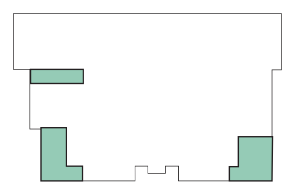
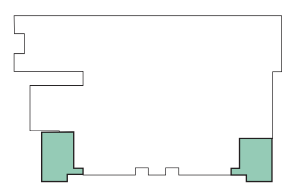
Without Pool

Option 4b is similar to 4a in its new building approach, but it meets all Educational Specification requirements without having to maintain the pool or existing facility.
Option 4b is the most efficient of the schemes.

Option 4b is similar to Option 4a in that it efficiently meets the Educational Specification requirements by demolishing the existing building and building a new facility next to the park.This option does not include the pool or keep the existing facility,making it the most efficient of the options explored.

Options Matrix

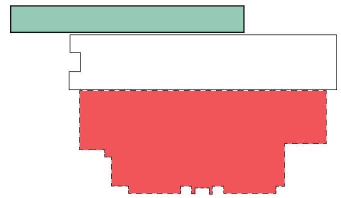
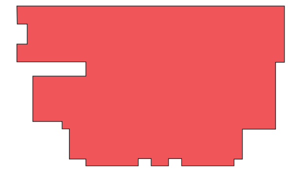
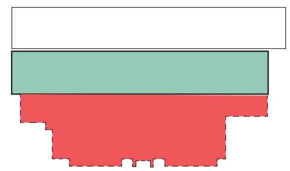
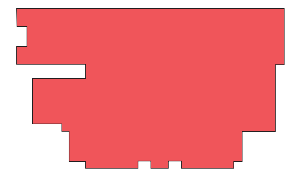
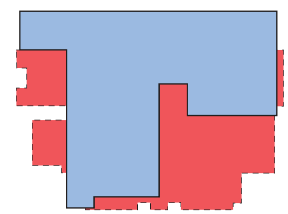
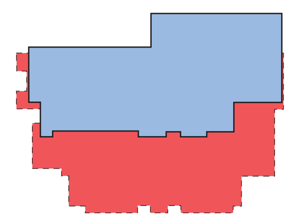
Renovation | Addition | New Construction | Demolition

OPTION		RENOVATION	ADDITION	NEW CONSTRUCTION
1a	TOTAL BUILDING AFTER ADDITION = 99,880 SF NET ASSIGNABLE SF = 58,962 SF EFFICIENCY = 59.0%	 TOTAL = 99,880 SF	 TOTAL = 0 SF	 TOTAL = 0 SF
1b	TOTAL BUILDING AFTER ADDITION = 96,312 SF NET ASSIGNABLE SF = 51,858 SF EFFICIENCY = 53.8%	 TOTAL = 90,578 SF	 TOTAL = 0 SF	 TOTAL = 0 SF
2a	TOTAL BUILDING AFTER ADDITION = 109720 SF NET ASSIGNABLE SF = 53,078 SF EFFICIENCY = 48.3%	 TOTAL = 92,962 SF	 TOTAL = 16,281 SF	 TOTAL = 0 SF
2b	TOTAL BUILDING AFTER ADDITION = 105,245 SF NET ASSIGNABLE SF = 53,803 SF EFFICIENCY = 51.1%	 TOTAL = 89,360 SF	 TOTAL = 10,151 SF	 TOTAL = 0 SF

N

Options Matrix (Continued)

Renovation | Addition | New Construction | Demolition

OPTION		RENOVATION	ADDITION	NEW CONSTRUCTION
3a	TOTAL BUILDING AFTER ADDITION = 98,622 SF NET ASSIGNABLE SF = 61,258 SF EFFICIENCY = 62.1%	 TOTAL = 18,439 SF	 TOTAL = 7,678 SF	 TOTAL = 0 SF
3b	TOTAL BUILDING AFTER ADDITION = 78,856 SF NET ASSIGNABLE SF = 53,078 SF EFFICIENCY = 67.3%	 TOTAL = 17,637 SF	 TOTAL = 55,485 SF	 TOTAL = 0 SF
4a	TOTAL BUILDING AFTER ADDITION = 80,743 SF NET ASSIGNABLE SF = 57,146 SF EFFICIENCY = 70.7%	 TOTAL = 0 SF	 TOTAL = 0 SF	 TOTAL = 57,146 SF
4b	TOTAL BUILDING AFTER ADDITION = 69,384 SF NET ASSIGNABLE SF = 50,053SF EFFICIENCY = 72.1%	 TOTAL = 0 SF	 TOTAL = 0 SF	 TOTAL = 69,647 SF

N

Cost Comparison Chart

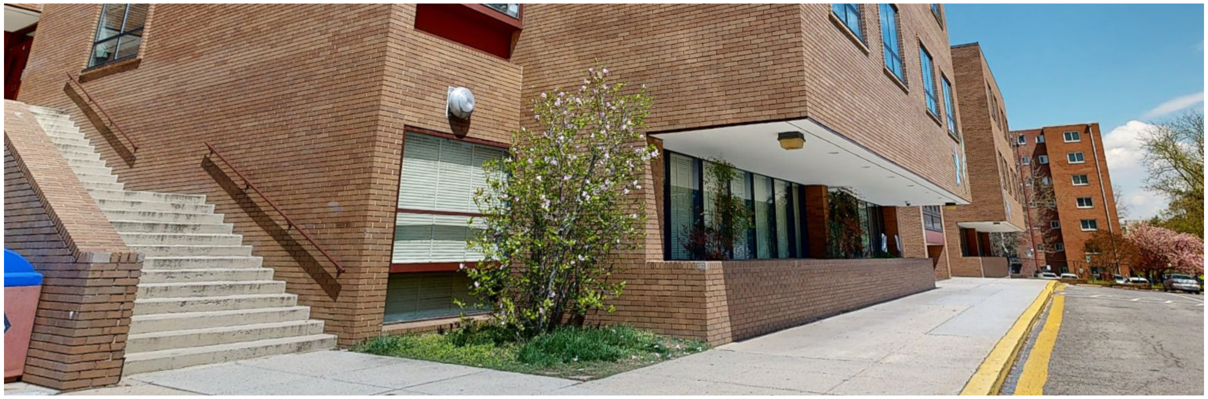
Square Footage

	Option 1A	Option 1B*	Option 2A	Option 2B*	Option 3A	Option 3B*	Option 4A	Option 4B*	Pool Renovation*	New Pool*	Larger Gym Alternate
	Existing Includes Pool/Gym	Existing Includes Gym	Existing Includes Pool/Gym	Existing Includes Gym	Existing Includes Pool/Gym	Existing Includes Gym					
Existing	12,534	5,734	12,534	5,734	12,035	5,734	0	0	0	0	0
Renovation	85,192	90,578	80,044	89,360	0	17,637	0	0	9,267	0	0
Addition	0	0	16,281	10,151	91,270	55,485	0	0	0	0	0
New Construction	0	0	0	0	0	0	80,353	69,647	0	9,267	2,600
Demolition	0	0	5,148	2,632	85,691	74,355	97,726	97,726			
Site and Parking	47,448	47448	55,785	62,498	92,847	76,365	60,693	61,673	0	0	
Total Gross Square Feet	97,726	96,312	108,859	105,245	103,305	78,856	80,353	69,647	9,267	9,267	2,600
Total Cost in FY 2025 Dollars											

Parking Count	45	45	44	45	60	80	59	78
Bus Parking Count	3	6	3	3	4	6	3	6

* Options receiving a cost estimate

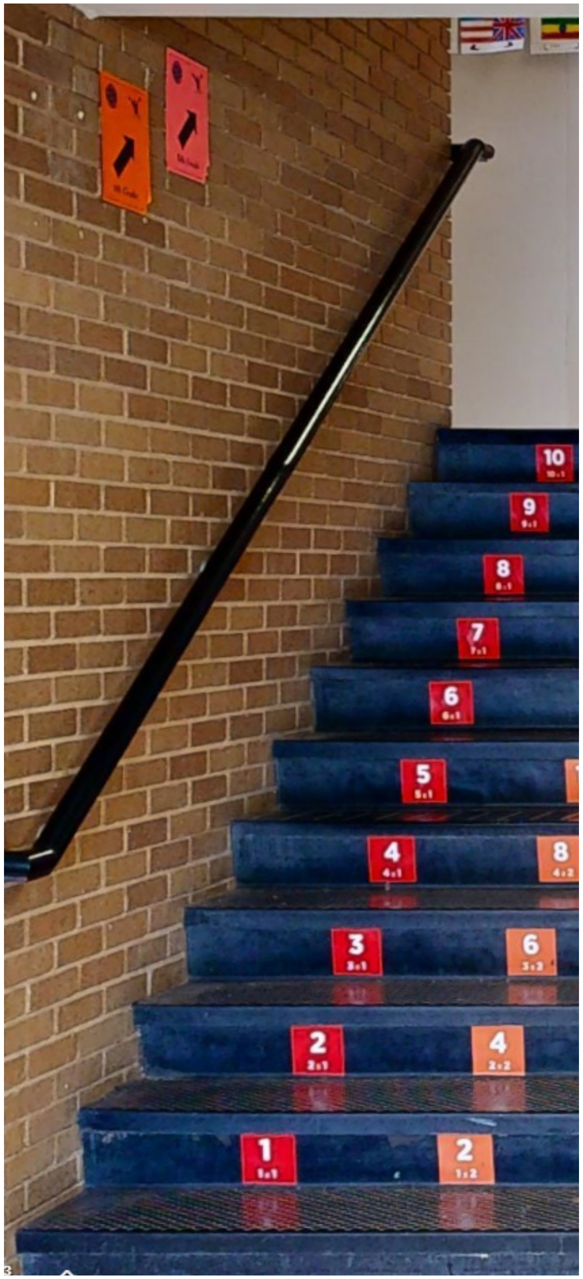
** Pool costs are included in the overall coast for "XA" options



Conclusions

The design options that have been developed meet the requirements of the educational specifications while also addressing the community's concerns regarding site accessibility and staff parking. These options also explore reducing the building's footprint, allowing for increased landscape and plaza space that can be used by both the PBES school and greater Takoma Park Community.

III. Project Scope, Objectives & Goals



Scope and Intent

MCPS plans to upgrade and modernize Piney Branch Elementary School to meet current educational specifications while also addressing concerns brought forward by building administrators, staff and the community. The goal being to provide a cost-effective, energy-efficient and safe facility to meet the future needs of the school. When completed, the facility will have an increased capacity of 644 students, with core spaces designed for 640 students

The feasibility study scope included review of the following site and building scope areas:

- Life safety code compliance
- Site and building accessibility
- Vehicular circulation
- Pedestrian circulation and safety
- Site Utilities and existing flood plains
- Building circulation
- Program adjacencies
- Structural systems
- Energy performance of building systems and fenestration assemblies
- Sustainable design principles

General Goals

MCPS identified the following goals for the project which served as guiding principles for the Piney Branch Elementary School Feasibility Study for a major capital project.

- Improve drop-off safety by separating pedestrians and cyclists from cars and buses
- Provide a welcoming entry point at the main entrance to the school with gathering space, aligned with the Maple Avenue corridor
- Overcome the ADA challenges for access to the play areas and fields
- Provide ample staff parking (currently about 50% deficient exclusive of consideration of the upcoming loss of street parking on Maple Ave.)
- Provide an improved street presence for the school and utilize design elements that feel more like an elementary school and less like an office building
- Decrease the footprint of the building in order to maximize site amenities
- Provide floorplans that minimize split levels and provide natural light for all classrooms
- Maintain open communication with frequent check-ins with City staff and M-NCPPC

Site Goals and Objectives

The site shall:

- Improve vehicular circulation, and the student arrival and pick-up sequence
- Separate bus, car, and parking traffic
- Improve pedestrian safety on site
- Make all areas of the site accessible. Create accessible access to the adjacent park.
- Create community space at building frontage to promote pedestrian circulation and improve access.
- Provide playground / site amenities on site for the PBES community
- Consolidate loading and service access points on site.

Building Goals and Objectives

The building shall:

- Improve circulation and provide direct access from corridors to all instructional spaces.
- Improve security at the main office.
- Improve passive security by eliminating areas that are not easily supervised / monitored by PBES teachers and staff
- Provide natural light to all instructional spaces.
- Provide accessible access to all areas of the building.
- "Right size" space to comply with the educational specifications.
- Maintain community access to large spaces (gym, media center, multi-purpose space) while securing the school after hours.
- Provide access to adjacent park from within the building.

Sustainability Goals and Objectives

The project will be required to comply with the Montgomery County Amendments to the 2021 IgCC. The school will be designed and constructed to meet requirements of the Maryland High Performance Building Program by conforming with Green Globes through its survey process. Criteria are being pursued in all Green Globes categories: project management, site, energy, water, materials and resources, emissions, and indoor environment.

The following sustainable features are being evaluated for the project:

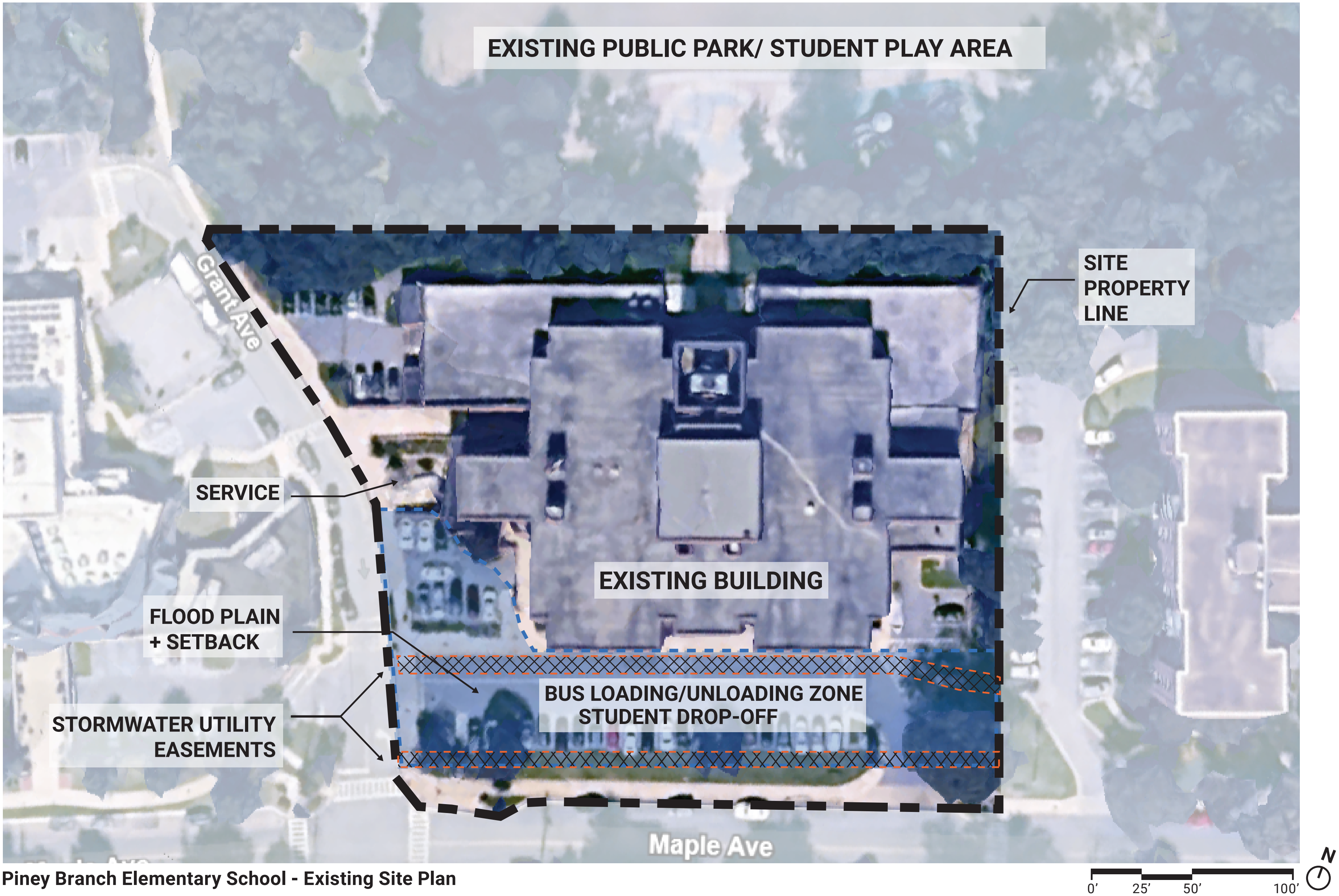
- Utilize micro-bioretention facilities to manage stormwater to reduce runoff quantity.
- Select drought-tolerant and native plants for landscaping to eliminate need for irrigation.
- Install water-conserving, low-flow plumbing fixtures.
- Select materials with transparent, documented environmental impacts.
- Divert construction "waste" from landfills to be salvaged for reuse or recycled.
- Utilize onsite renewable energy sources from solar panels and geothermal energy.


PINEY BRANCH SCHOOL

Vicinity Map

Piney Branch Elementary School - Vicinity Map

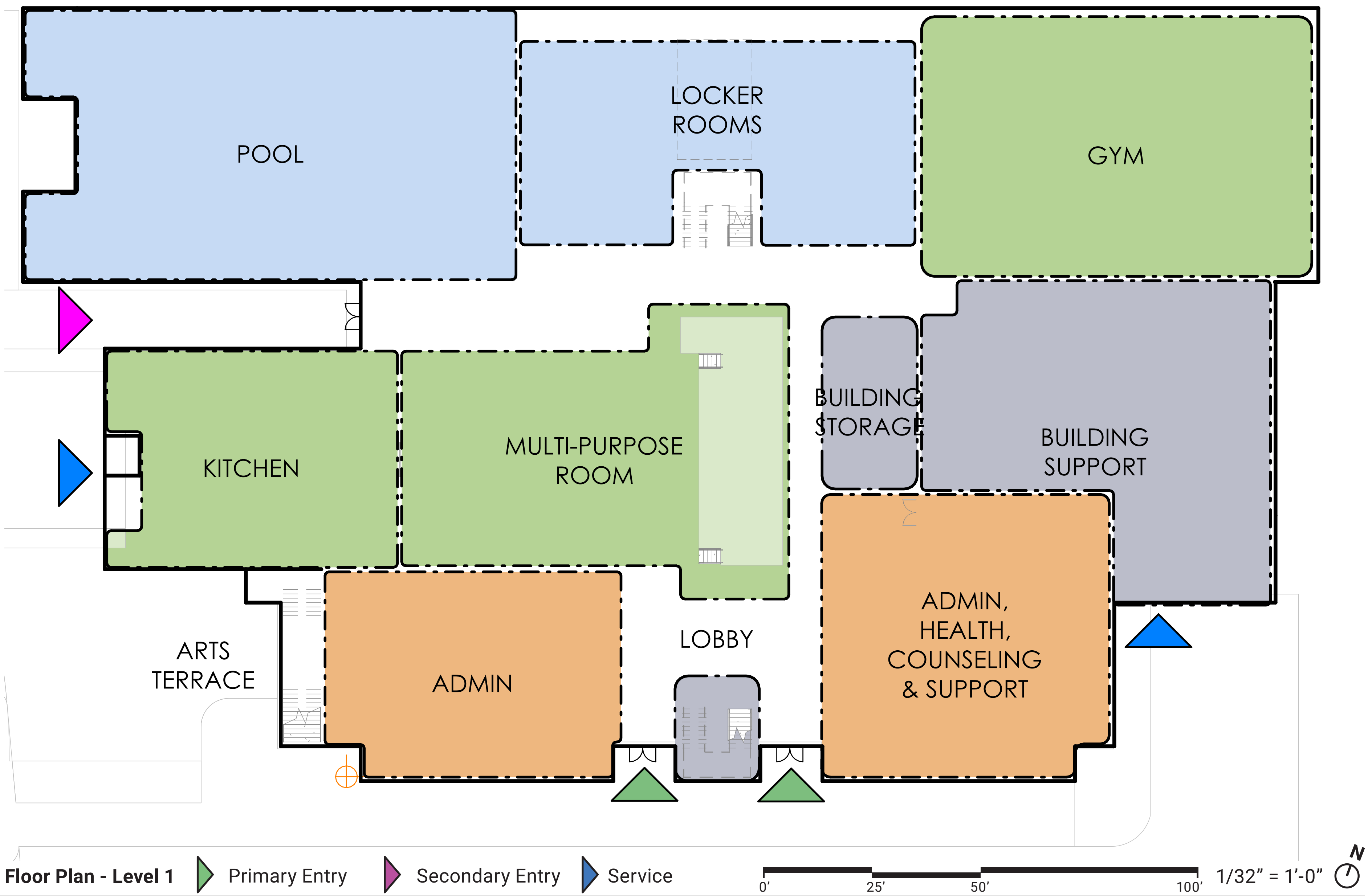
Existing Site Plan



Piney Branch Elementary School - Existing Site Plan

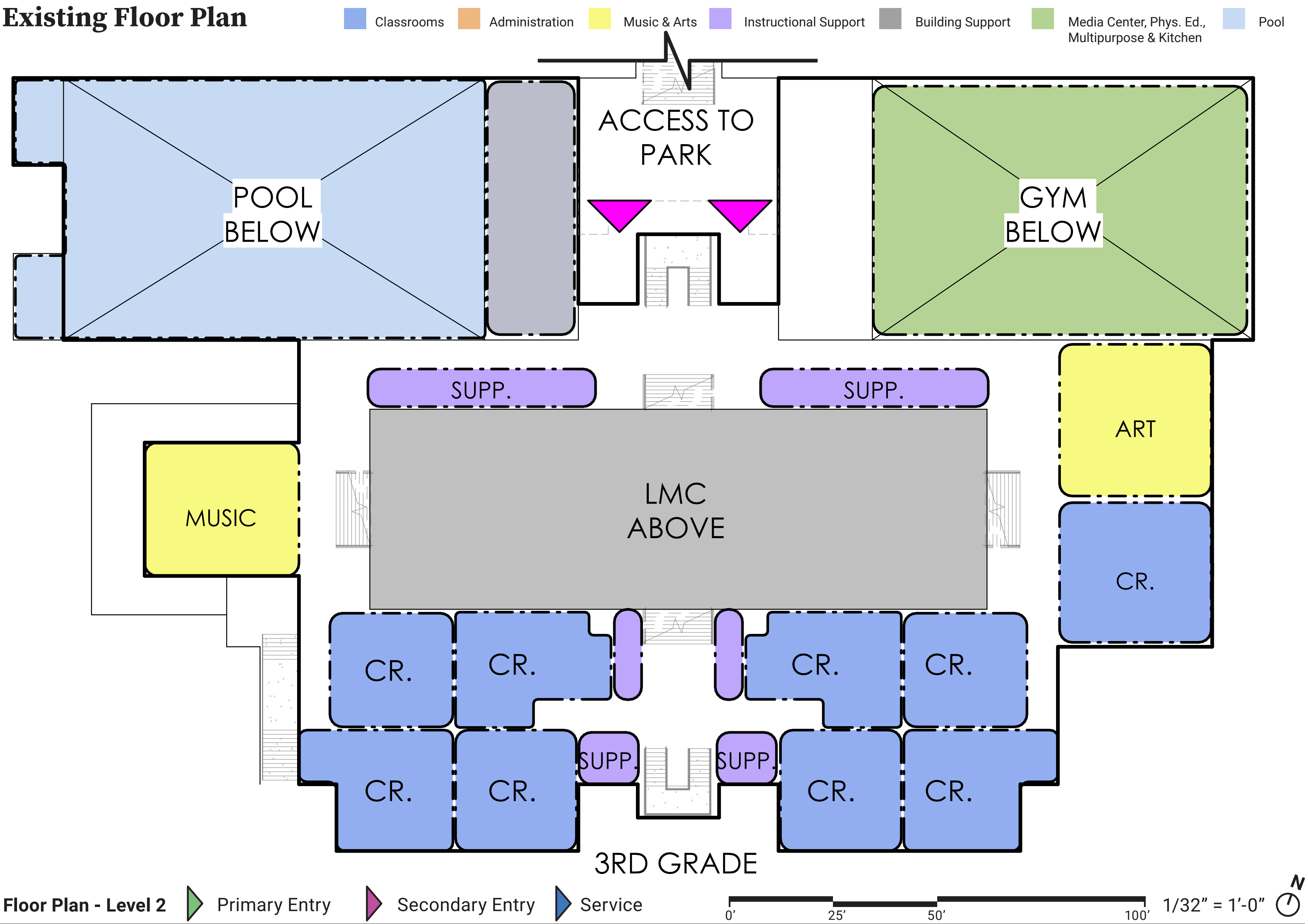
Existing Floor Plan

Classrooms | Administration | Music & Arts | Instructional Support | Building Support | Media Center, Phys. Ed., Multipurpose & Kitchen | Pool



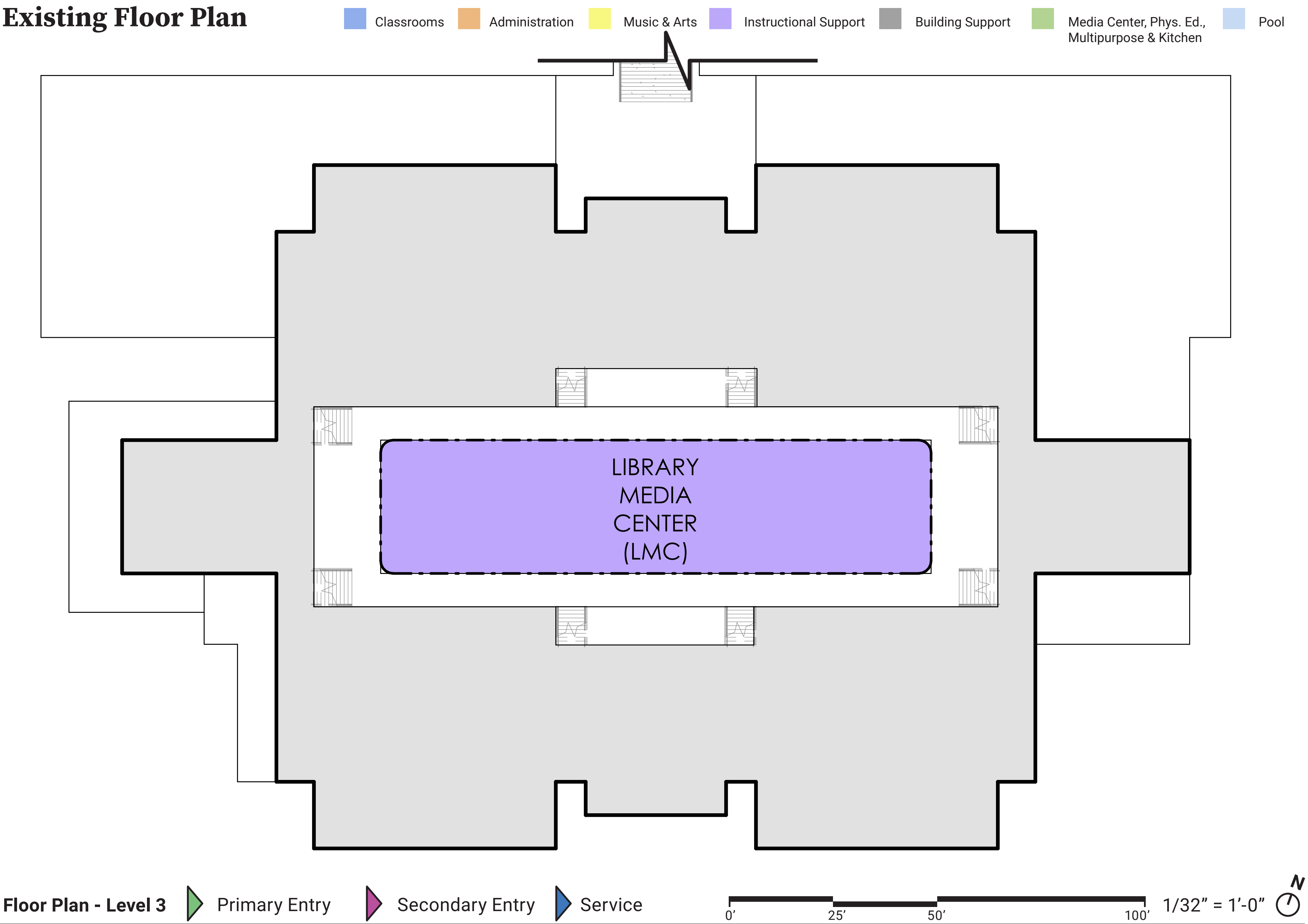
Floor Plan - Level 1 Primary Entry | Secondary Entry | Service

Existing Floor Plan



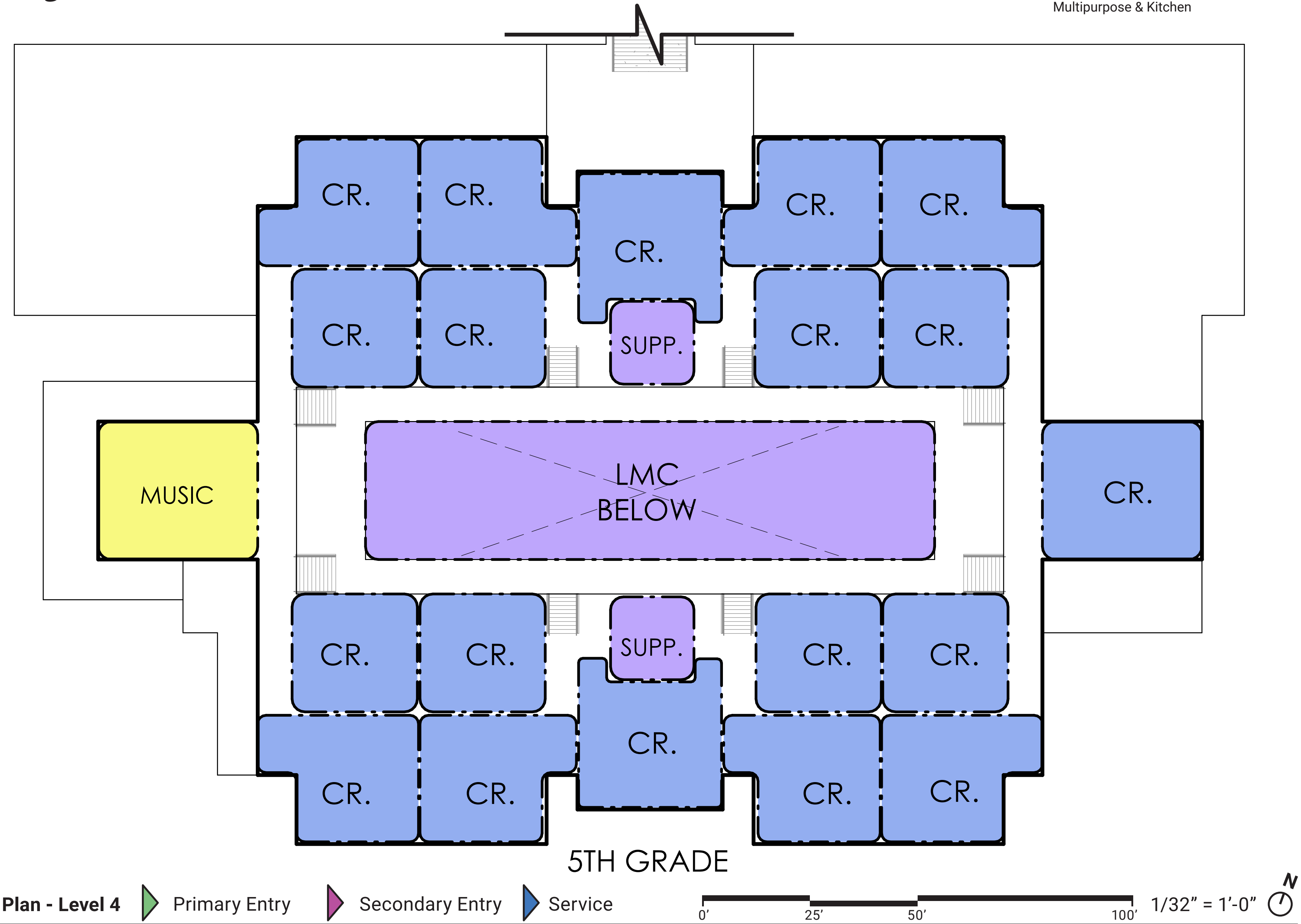
Floor Plan - Level 2

Existing Floor Plan



Existing Floor Plan

Classrooms | Administration | Music & Arts | Instructional Support | Building Support | Media Center, Phys. Ed., Multipurpose & Kitchen | Pool



Floor Plan - Level 4 Primary Entry Secondary Entry Service

Site Plan - Existing

Axon Diagrams - Existing

Level 1

Level 2

Level 3

Analysis - Existing Conditions

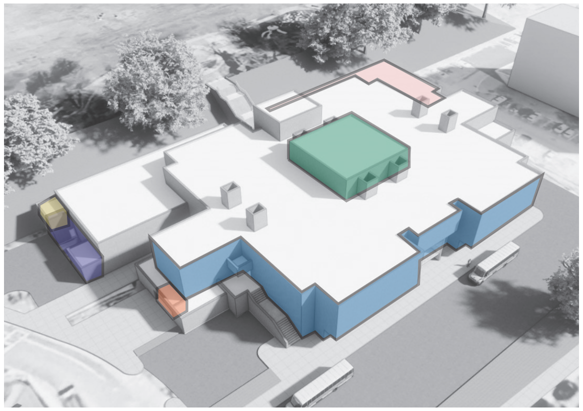
Program Comparison:

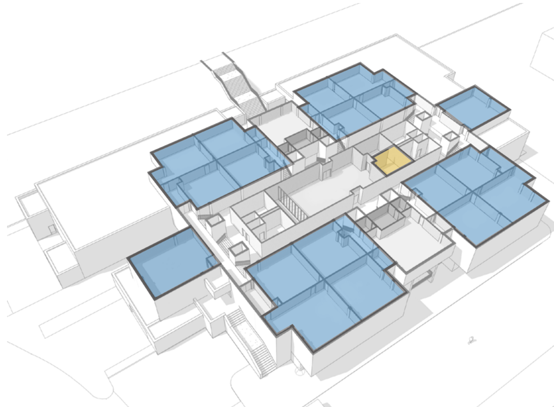
Zone / Areas	Ed Spec	Existing	Variance (%)
Classrooms	27,650	27,736	0%▲
Support Rooms	2,420	2,662	10%▲
Library Media Center	2,875	4,224	47%▲
Physical Education*	4,430	5,341	21%▲
Multi-Purpose Room*	4,135	4,916	19%▲
Kitchen*	1,372	3,257	137%▲
Administration	1,765	1,863	6%▲
Counseling Suite	320	815	155%▲
Staff Development Area	600	1,625	171%▲
Health Services Suite	710	892	26%▲
Staff Areas	750	935	25%▲
Building Support Factilities	1,885	4,740	151%▲
Building Support Areas	600	3,398	466%▲
Pool & Locker Rooms**	0	6,891	100%▲
Total Proposed (NSF) =	49,512	10,934	
Total Options =		69,295	
Variance (%)=		39.96%	
Total Buidling Gross SF (BGSF) =	102,461		

GENERAL NOTES

*When utilizing the existing footprint of the gymnasium/multi-purpuse/platform/kitchen is being maintained (shown with BOLD text). Exisiting footprint is oversized when compared to the proposed program.

** Exisiting pool footprint is being maintained (shown with BOLD text). Pool scope is not part of proposed program.





Original Building	1971
Gym Roof Renovation	1990
Renovation & Addition	1990-1991
Tractor Shed Addition	1994
Pool System Renovation	1999
Trash Room Addition	2010
HVAC Renovation	2013
Staff Toilet Renovation	2015

Existing Conditions Summary

The original building was constructed in 1971. Multiple renovations have been completed on the building, with the latest renovation being completed in 2015. The graphic to the left shows the areas of the building renovated, color coded by year. The perimeter of the existing building has 3-levels, while the the center core of the building is two levels, creating a split-level configuration. Below is a summary of the existing building assemblies:

Structure:

- Steel and Concrete. Refer to structural narrative for additional information.

Exterior Walls:

- The building exterior is mostly brick veneer. While most of the veneer appears to be in good condition, there are a fair number of step cracks that will require some selective brick replacement.
- The brick retaining walls also show some cracking and will require repair.

Roof:

- Built up roof is in fair condition but is over 30 years old and should be replaced
- There is movement of the top course of brick at parapet. The parapet needs to be stabilized and a larger coping installed to avoid future water infiltration.
- Few locations of missing brick at parapet outside corners

Fenestration:

- There are still some original windows. The remainder of the windows are over 30 years old. Windows should be replaced
- The HM storefront door assemblies are in good condition.

Interior:

- The interior walls are primarily painted concrete masonry units (CMU) with rubber base. The ceilings are acoustical panel ceilings with flat panel light fixtures. The flooring is primarily vinyl composite tile with carpet in offices. The first floor is terrazzo tile with rubber base.
- There are select locations where the exterior brick is used as an interior finish on the walls.
- The gym exterior walls is partially below grade and shows signs of ground water infiltration.
- There are also numerous signs of water damage observed in the ceiling, which could be the result of roof leaks and/or sprinkler systems.

Restrooms:

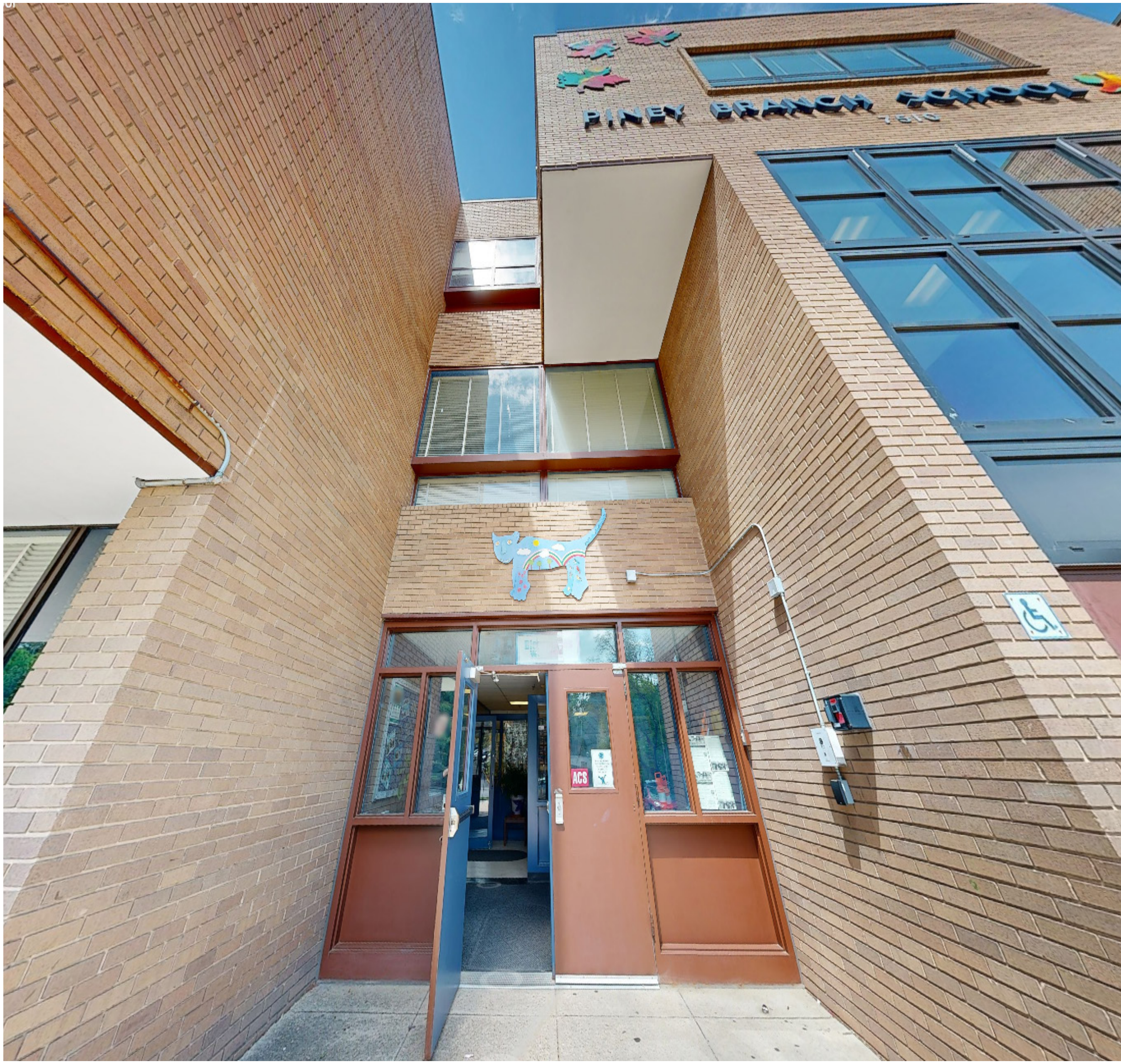
- The group toilet rooms have been recently renovated. If montgomery county adopts the ICC A117.1 (2017) Edition of the accessible and usable buildigns and facilities standard, the restrooms will no longer be considered accessible and will require upgrades to meet fixture clearances.

Locker rooms:

- The pool locker rooms do not meet current accessibility requirements and will need to be fully upgraded.

Stairs:

- The stair railings and guardrails do not meet current codes and will require replacement. Additionally, the existing steps are inconsistent which could lead to falls. The consistency of the stair risers and treads will need to be improved.


PINEY BRANCH SCHOOL
7510

General

As a response to MCPS' request to develop a feasibility study for Piney Branch Elementary School, eight (8) options were created. These options explored the implementation of the latest Piney Branch Educational Specifications (ed specs) and the various configurations the building and site could take form. Each option also includes a version with a pool (represented with an "A") and without a pool (represented with a "B"). Together, each "A" and "B" scenario create an "option set". Each option set explore the following scenarios:

1. A full renovation of the existing school ("renewal" without any change to the building footprint)
2. A full renovation of the existing school + a small addition/demolition (less than 50% of the existing building)
3. A full renovation of the existing school + a larger addition/demotion (more than 50% of the existing building)
4. A full demolition of the existing school + a brand new school (on existing site)

Common Site Design Elements for Each Option

- All site features will be ADA accessible (site will be accessible but the park will not be accessible in option 1a/b).
- A safer bus loop and student drop off area by separating vehicular traffic from pedestrian circulation and access to the site.
- A minimum of 44 parking spots and a 3 bus loop are included in each option.
- There will be complete demolition of existing site elements and the installation of new sidewalks, asphalt paving and striping, sod, plantings, and trees, and retaining walls. New waterline, gas and electrical services will be installed. To meet stormwater management requirements, underground systems will be installed.

Common Building Design Elements for Each Option

Architectural:

- All spaces listed within the Space Summary of the Educational Specifications are included in each option.
- The Administrative area is located at the main entrance of the school, allowing for visibility of visitors and easy of security during the school day.
- Aside from the new construction option (Option 4a/b), all other options maintain the existing gymnasium footprint as part of the renovation.
- The pool may be easily isolated and secured from the rest of the building.
- Aside from Option 1a/b, all other options will enhance the ADA accessibility of the school.
- All hazardous material will be abated from the existing building during the demolition process.
- All new systems will meet local code, accessibility, and MCPS requirements.
- All interior finishes will be demolished and replaced.
- All options will include new toilet facilities to meet accessibility code in effect at the time of design.
- Options that maintain existing building elements will require a new roof. The roof structure will likely require reinforcing to support solar cells.
- Options that propose elevated play areas include green roofs and 6’-0” fenses at the roof, should mcps agrees to the layout.

Common Building Design Elements for Each Option (Continued)

Structural:

- Inspections will be performed to confirm if structural repairs are needed at pool pump room, gym foundation wall, and roof parapet brick. Modifications of the interior partition walls may require reinforcement of the lateral force-resisting system. Removal of the interior split level will require new columns, framing, and footings. Additions and new build options will consist of steel roof deck and composite floor slabs supported by steel braced frames, concrete foundation walls, continuous spread footings.

Fire protection

- There will be a complete demolition of the existing sprinkler system and the installation a new system with separate zones matching the alarm pull zones.

Plumbing

- There will be a complete demolition of the existing domestic water system, water heaters, plumbing fixtures, sanitary, storm, and gas piping, and the installation of new systems

HVAC:

- There will be a complete demolition of existing boiler, chilled water, air handler, and exhaust systems, and the installation of a new centralized air-to-water heat pump system serving DOAS, VRF, air handling, and ductless split system units.

Electric power system

- There will be a complete demolition of existing electrical distribution equipment, light fixtures and controls, and receptacles and the installation of new systems.

Emergency power system

- There will be a complete demolition of the existing generator system and the installation of a new outdoor natural gas generator and weatherproof enclosure.

Fire detection and alarm system

- There will be a complete demolition of the existing fire detection and alarm system and the installation of a new system.

Av / IT

- There will be a complete demolition of voice/data and public address systems and the installation of new systems.

Security

- There will be a complete demolition of security systems and the installation of new door access control, intrusion detection, and video surveillance systems.

Pool

- There will be a complete demolition of the filtration and chemical treatment systems and the installation of new systems.

Option 1a:

A full renovation of the existing school ("renewal" without changing the building footprint)

Renovation
No Demolition
No Addition

With Pool

Total Cost = **$59,219,915**

The first option set explores the complete renovation of the existing facility.

The approach to the building entrance is reconfigured to provide safer circulation for student drop-off and bus unloading/loading. This is achieved by redesigning the site to create separate flows for both vehicular approaches. The student drop off area remains at the front of the building while a bus unloading/loading area is created along Grant Avenue, which is a one way street connecting to Maple Avenue. The main entrance to the building then remains facing Maple Avenue, which allows the school presence to be easily identifiable. The existing site is then reconfigured to allocate for 45 parking spots adjacent to the main entrance of the school, as well as 4 bus spots along the western portion.

Option 1a

Upon entering the building, much of the interior configuration and programmatical elements will remain in their current locations as improvements are made to enhance the overall experience and efficiencies. The main entrance to the school will feature a higher level of security through redesign of the administrative area. This replanning will allow for a better line of sight to all visitors entering the school while restricting visitor access directly into the school proper. While the first-floor diagram looks familiar, the entire building will go through a renovation and refresh to include:

- Building Code and Accessibility upgrades throughout the building and site
- Replacing fenestrations (windows & doors)
- Replacing roof
- Replacing to interior building assemblies and finishes
- Upgrades to more efficient building systems
- Replacement of building systems infrastructure (conductors, piping, etc.)

Moving up the building, the renovation will include the implementation of a central corridor between all classrooms which are currently interconnected. This new corridor creates better efficiency and accessibility from classroom to classroom in addition to improved circulation across each floor . While not all classrooms meet the required square footage, there are opportunities for small breakout areas within the corridors on the second and fourth floors, enabling new learning spaces outside the classroom. This new corridor also reshuffles some programmatic elements, bringing the music and instrumental music rooms to the first floor to be closer to the multipurpose room and platform.

Additionally, this option noted with an “a” means the inclusion of the pool. In this renovation option, the pool would remain in its current location and pool systems and finishes would be upgraded.

Site Plan - Option 1a

Axon Diagram - Option 1a

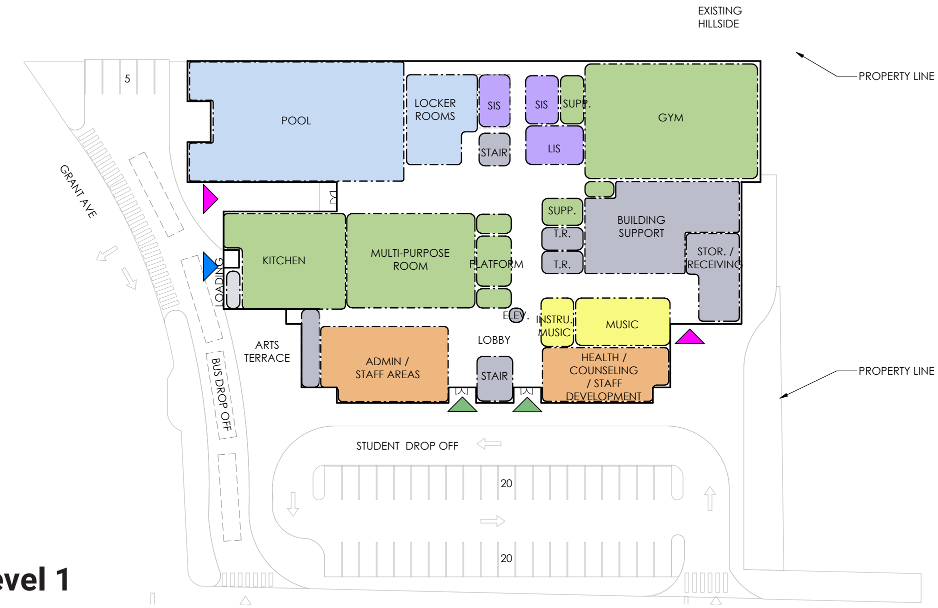
Level 1

Level 2

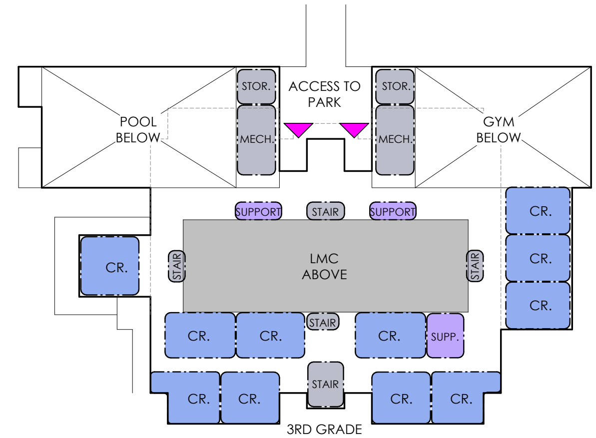
Level 3

Floor Plans - Option 1a

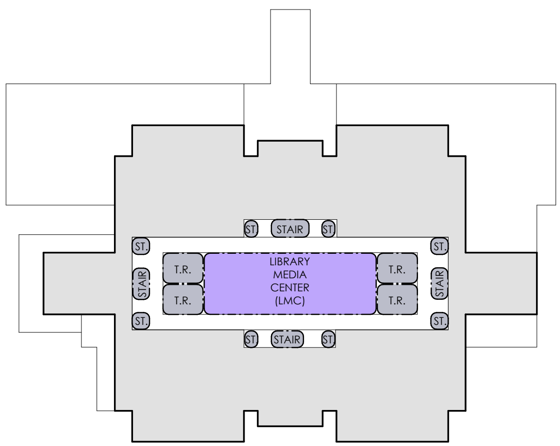
Classrooms | Administration | Music & Arts | Instructional Support | Building Support | Media Center, Phys. Ed., Multipurpose & Kitchen | Pool



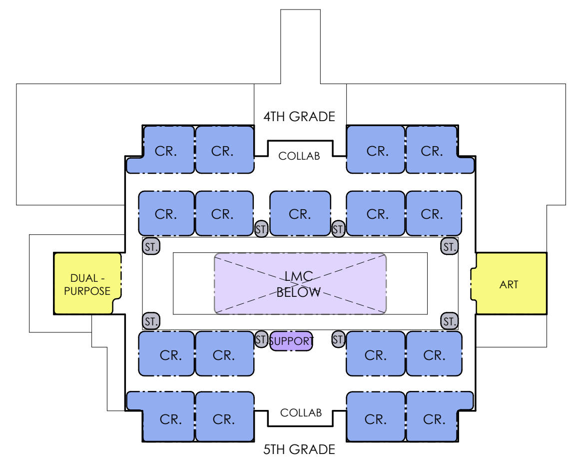
Level 1



Level 2



Level 3



Level 4

Primary Entry | Secondary Entry | Service

0' 50' 100'

N

Option Analysis - Option 1a:

A full renovation of the existing school ("renewal" without changing the building footprint)

Program Comparison:

Zone / Areas	Ed Spec	Option 1A (Pool)	Variance (%)
Classrooms	27,650	21,408	-29%▼
Support Rooms	2,420	2,553	5%▲
Library Media Center	2,875	2,831	-2%▼
Physical Education*	4,430	**5,645**	22%▲
Multi-Purpose Room*	4,135	**4,087**	-1%▼
Kitchen*	1,372	**2,827**	51%▲
Administration	1,765	1,765	0%▲
Counseling Suite	320	350	9%▲
Staff Development Area	600	650	8%▲
Health Services Suite	710	750	5%▲
Staff Areas	750	744	-1%▼
Building Support Facilities	1,885	1,095	-72%▼
Building Support Areas	600	600	0%▲
Pool & Locker Rooms**	0	8,292	100%▲
Total Proposed (NSF) =	49,512		
Total Options =		53,597	
Variance (%)=		8.25%	
Total Buidling Gross SF (BGSF) =	102,461	99,880	

GENERAL NOTES
*When utilizing the existing footprint of the gymnasium/multi-purpuse/platform/kitchen is being maintained (shown with BOLD text). Exisiting footprint is oversized when compared to the proposed program.
** Exisiting pool footprint is being maintained (shown with BOLD text). Pool scope is not part of proposed program.

Parking Spaces Required: 80
Parking Spaces Provided: 45
Bus Queuing Provided: 3

Advantages:

- Maintains larger gymnasium
- Largest roof area available of all the options for renewable energy systems (i.e photovoltaic panels)
- Least expensive (cost per square foot)

Disadvantages:

- Over half of the classrooms will not have natural light
- The average classroom is 29% below the program square footage
- Adjacent park / playground are not accessible
- Library location (upper floors) is not easily accessible and secure from the rest of the building after school hours
- There is no secure separation between the pool facilities and the school
- Area within the existing building footprint is more square footage then required by the educational specifications. The existing building footprint and structural configuration creates does not provide opportunities to utilize the extra space efficiently
- Multiple loading / building service entrances
- Provides the fewest number of bus queuing spaces when compared to other options
- 45 of the 80 required parking spaces have been provided

Option 1b:

A full renovation of the existing school ("renewal" without changing the building footprint) without pool

Renovation
No Demolition
No Addition

Without Pool

Total Cost = **$54,154,169**

Option 1b follows much of the same concepts as Option 1a with the absence of the pool on the first floor.

This notion of removing the pool creates an opportunity to shift the kitchen and multipurpose room into the existing area. The shift offers an opening on the site to relocate the loading and receiving to better separate that function from the student drop-off area. The existing car park is then reconfigured to include a separate bus unloading/loading area along the western portion of the building, with the parking lot reconfigured to allow for 45 spots, and the bus drop-off area allowing for 6 buses at a time.

On the upper floors, the classrooms have been reconfigured to align with the overall square footage requirements listed in the ed specs, as well as allowing for flexible furniture arrangements to support a variety of learning modules. By doing so the Art, Music, and Dual-Purpose rooms have been co-located on the first floor, still providing the necessary connection to the Platform and Multipurpose Room.

Site Plan - Option 1b

Axon Diagrams - Option 1b

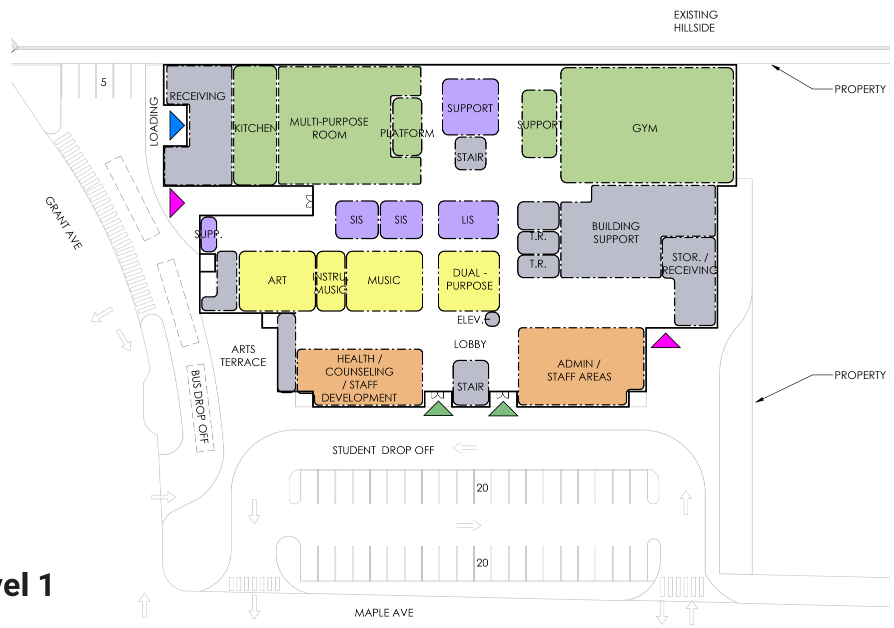
Level 1

Level 2

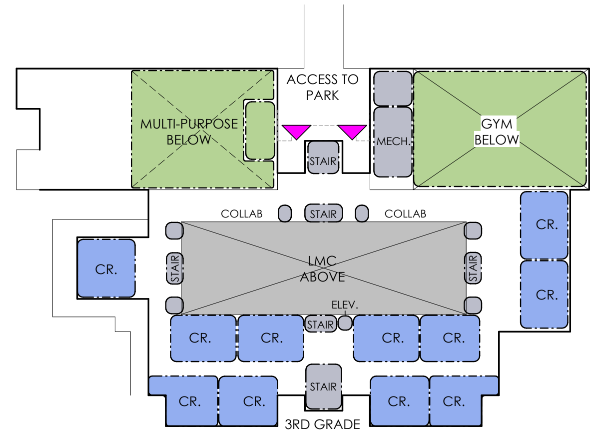
Level 3

Floor Plans - Option 1b

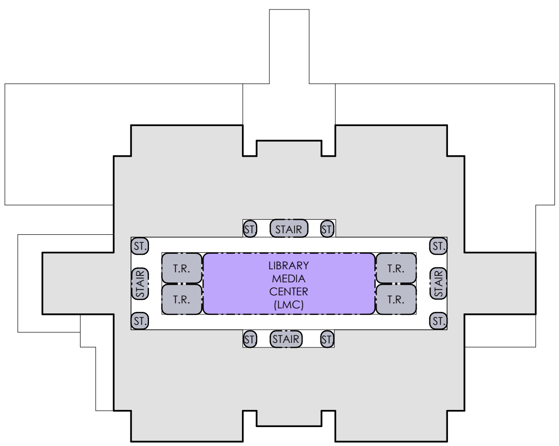
Classrooms | Administration | Music & Arts | Instructional Support | Building Support | Media Center, Phys. Ed., Multipurpose & Kitchen | Pool



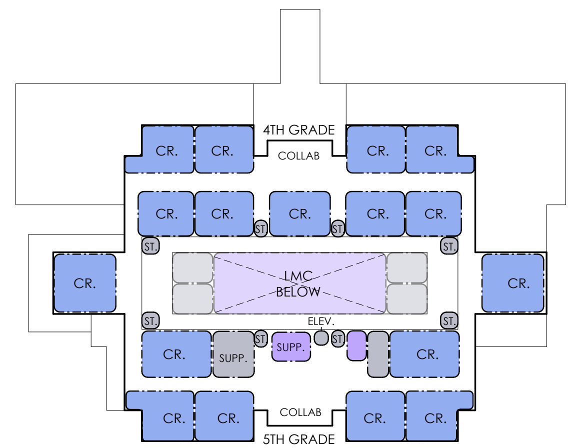
Level 1



Level 2



Level 3



Level 4

Primary Entry | Secondary Entry | Service

0' 50' 100'
N

Option Analysis - Option 1b:

A full renovation of the existing school ("renewal" without changing the building footprint), without pool

Program Comparison:

Zone / Areas	Ed Spec	Option 1B (No Pool)	Variance (%)
Classrooms	27,650	26,872	-3%▼
Support Rooms	2,420	2,923	17%▲
Library Media Center	2,875	2,831	-2%▼
Physical Education*	4,430	**5,980**	26%▲
Multi-Purpose Room*	4,135	4,598	10%▲
Kitchen*	1,372	1,380	1%▲
Administration	1,765	1,800	2%▲
Counseling Suite	320	350	9%▲
Staff Development Area	600	660	9%▲
Health Services Suite	710	780	9%▲
Staff Areas	750	800	6%▲
Building Support Factilities	1,885	4,843	61%▲
Building Support Areas	600	1,823	67%▲
Pool & Locker Rooms**	0	0	-
Total Proposed (NSF) =	49,512		
Total Options =		55,640	
Variance (%)=		12.38%	
Total Buidling Gross SF (BGSF) =	102,461	99,880	

GENERAL NOTES

*When utilizing the existing footprint of the gymnasium/multi-purpuse/platform/kitchen is being maintained (shown with BOLD text). Exisiting footprint is oversized when compared to the proposed program.

** Exisiting pool footprint is being maintained (shown with BOLD text). Pool scope is not part of proposed program.

Parking Spaces Required: 80

Parking Spaces Provided: 45

Bus Queuing Provided: 6

Advantages:

- Maintains larger gymnasium
- Music is near Multipurpose
- Multi-purpose occupies former pool space, allow this option to have a Multi-purpose room that is 10% larger than program
- Existing building footprint / layout provides space for open collaboration adjacent to classrooms
- Largest roof area available of all the options for renewable energy systems (i.e photovoltaic panels)
- Least expensive cost per square foot

Disadvantages:

- Music and Dual-Purpose do not have access to natural light.
- Adjacent park / playground are not accessible
- Library location (upper floors) is not easily accessible and secure from the rest of the building after school hours
- Area within the existing building footprint is more square footage then required by the educational specifications. The existing building footprint and structural configuration this creates does not provide opportunities to utilize the extra space efficiently
- Multiple loading / building service entrances
- Limited bus queuing
- 45 of the 80 required parking spaces have been provided
- The existing exterior walls limit opportunities for providing an energy efficient envelop, negatively impacting the energy efficiency of the mechanical systems

Option 2a:

A full renovation of the existing school + a small addition/demolition (less than 50% of the existing building)

Renovation
Small Demolition
Small Addition

With Pool

Option 2a explores the elimination of the split-level by infilling the existing third floor and creating a small addition on the upper levels. By eliminating the split-level, the interior achieves improved circulation, wayfinding, and accessibility across all floors by decreasing the number of stairs and diminishing the circuitous nature of the existing floor plan.

The upgrades to the site mirror those for Option 1a and 1b. A separation between bus unloading/loading and student drop-off is created to provide a safer environment for students. An outdoor learning bridge on the third level creates an accessible throughway to the neighboring park, as well as establishing an additional space for learning. Green roofs on either side of the bridge allow more opportunities for instruction with direct access to adjacent classrooms.

Option 2a

The main entrance of the building remains along Maple Avenue and the Administrative area is reworked to provide better security and line of sight to those entering the school. With the infill of the existing Library Media Center, the new LMC is relocated, bringing the informational hub of the school down and centrally located as the heart of the school. The Multipurpose, Kitchen, Gymnasium, and Building Support spaces remain in their existing locations and receive proper renovations and upgrades to bring them up to code, provide efficiencies, and to refresh finishes.

On the upper floors, the additions to the building allow the classrooms to be right sized as per the educational specifications. Additionally, a majority of the classrooms have been reconfigured to provide direct access to daylight and exterior views. This includes the Art and Dual-Purpose rooms, which in addition to the Music room, remain on the upper floors. This design offers an opportunity to create a connection between Music and the multi-story LMC below.

Site Plan - Option 2a

Axon Diagrams - Option 2a

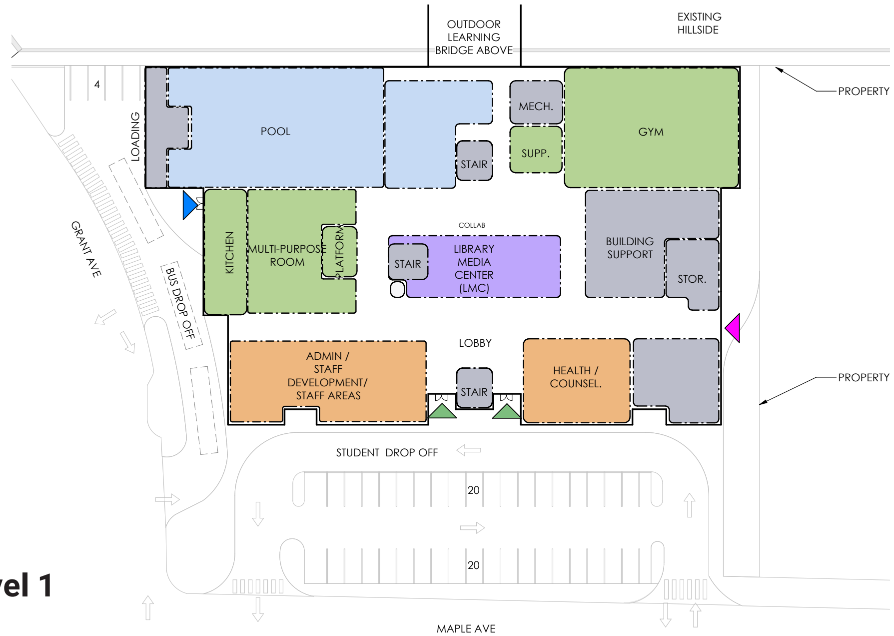
Level 1

Level 2

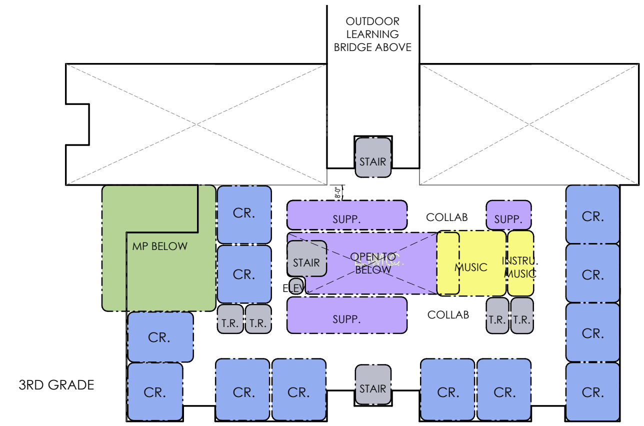
Level 3

Floor Plans - Option 2a

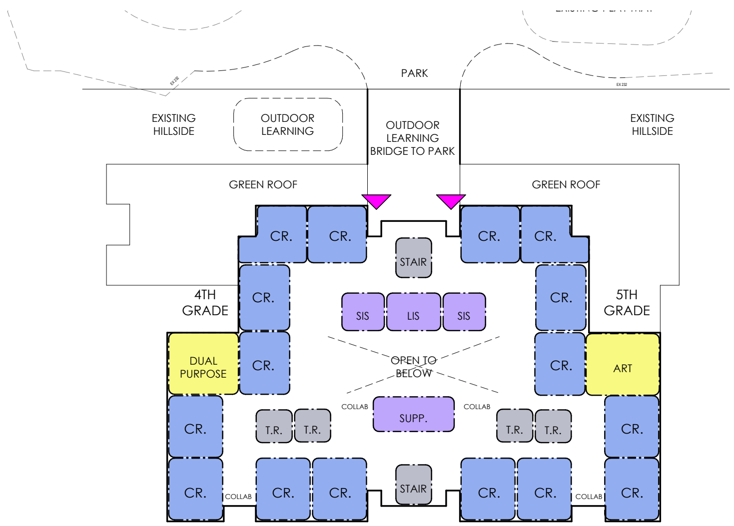
Classrooms | Administration | Music & Arts | Instructional Support | Building Support | Media Center, Phys. Ed., Multipurpose & Kitchen | Pool



Level 1



Level 2



Level 3

Primary Entry | Secondary Entry | Service

0' 50' 100'

N

Option Analysis - Option 2a:

A full renovation of the existing school + a small addition/demolition (less than 50% of the existing building)

Program Comparison:

Zone / Areas	Ed Spec	Option 2A (Pool)	Variance (%)
Classrooms	27,650	28,675	4%▲
Support Rooms	2,420	4,406	45%▲
Library Media Center	2,875	2,770	-4%▼
Physical Education*	4,430	**6,255**	54%▲
Multi-Purpose Room*	4,135	3,691	22%▲
Kitchen*	1,372	1,430	4%▲
Administration	1,765	2,000	12%▲
Counseling Suite	320	500	36%▲
Staff Development Area	600	1,000	40%▲
Health Services Suite	710	800	11%▲
Staff Areas	750	1,200	38%▲
Building Support Facilities	1,885	2,981	37%▲
Building Support Areas	600	2,380	75%▲
Pool & Locker Rooms**	0	8869	100%▲
Total Proposed (NSF) =	49,512		
Total Options =		66,957	
Variance (%)=		35.23%	
Total Buidling Gross SF (BGSF) =	102,461	103,113	

GENERAL NOTES

*When utilizing the existing footprint of the gymnasium/multi-purpuse/platform/kitchen is being maintained (shown with BOLD text). Exisiting footprint is oversized when compared to the proposed program.

** Exisiting pool footprint is being maintained (shown with BOLD text). Pool scope is not part of proposed program.

Parking Spaces Required: 80

Parking Spaces Provided: 44

Bus Queuing Provided: 3

Advantages:

- Maintains larger gymnasium
- The floor levels were re-stacked, eliminating the split level. This improved interior visibility and security
- Adjacent park / playground are accessible
- Library location (first floors) is easily accessible and secure from the rest of the building after school hours

Disadvantages:

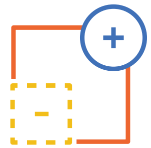
- There is no secure separation between the pool facilities and the school
- Music is not adjacent to Multipurpose (performance platform)
- Multiple loading / building service entrances
- Provides the fewest number of bus queuing spaces when compared to other options.
- Parking count does not meet the Educational Specifications
- Provides the fewest parking spaces of all the options. 44 of the 80 required parking spaces have been provided
- The existing exterior walls limit opportunities for providing an energy efficient envelop, negatively impacting the energy efficiency of the mechanical systems
- Greatest construction cost/square foot

Option 2b:

A full renovation of the existing school + a small addition/demolition (less than 50% of the existing building) without pool

Renovation
Small Demolition
Small Addition

Without Pool



Option 2b is similar to Option 2a but with the absence of the pool on the first floor. The addition on the upper floors from option 2a is included here as well, and once again removes the split-level by infilling the existing third floor.

Mirroring Option 1b, the Multipurpose, Platform, and Kitchen areas are relocated to the space where the pool had originally been. The site is then reconfigured to pull the loading further from the bus unloading/loading area and the student drop-off area has been separated to create a comprehensive and safe flow for all visitors. Once again, the outdoor learning bridge on the third floor allows for accessibility to the adjacent park and play areas, and a green roof on either side of the bridge gives more outdoor learning opportunities for the students and teachers.

The Art, Music, and Instrumental Music rooms are relocated to the first floor with direct access to daylight, views, and conveniently adjacent to the Multipurpose room. Bringing these program elements down allows all the classrooms on the upper floors to be right-sized and rearranged along the perimeter of the building, providing windows to all rooms.

Site Plan - Option 2b

Axon Diagrams - Option 2b

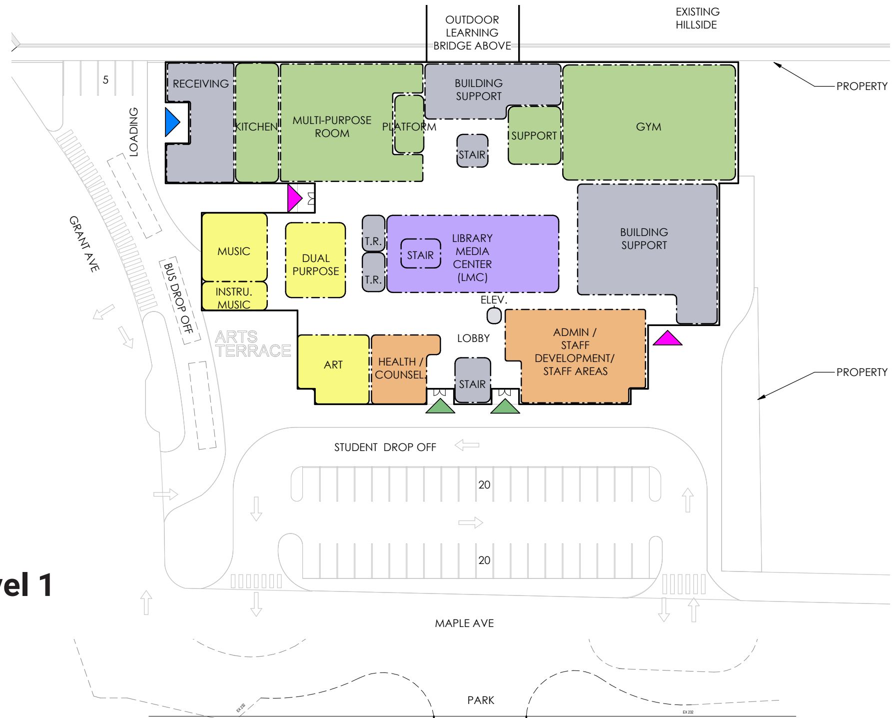
Level 1

Level 2

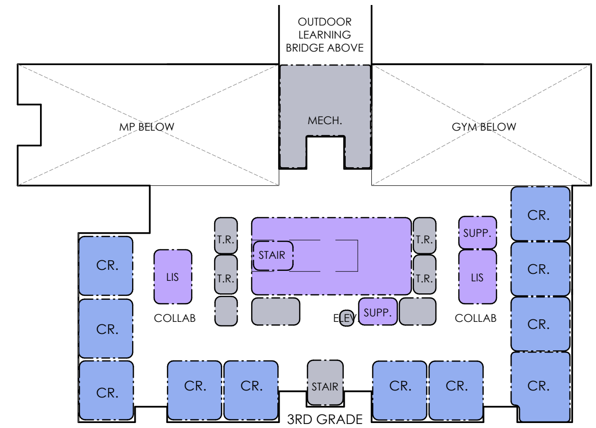
Level 3

Floor Plans - Option 2b

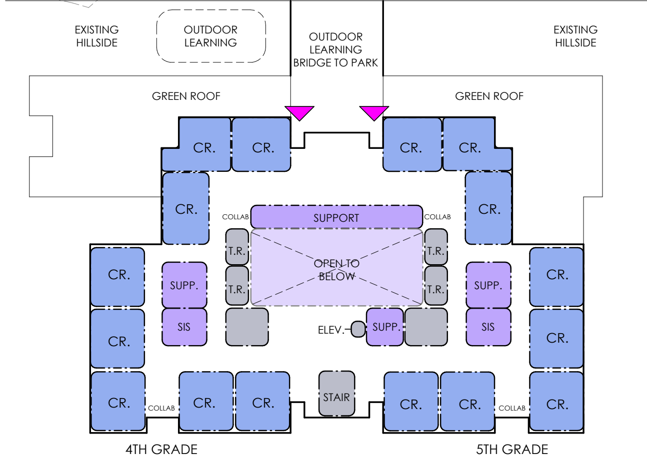
Classrooms | Administration | Music & Arts | Instructional Support | Building Support | Media Center, Phys. Ed., Multipurpose & Kitchen | Pool



Level 1



Level 2



Level 3

Primary Entry | Secondary Entry | Service

0' 50' 100' N

Option Analysis - Option 2b:

A full renovation of the existing school + a small addition/demolition (less than 50% of the existing building) without pool

Program Comparison:

Zone / Areas	Ed Spec	Option 2B (No Pool)	Variance (%)
Classrooms	27,650	28,444	3%▲
Support Rooms	2,420	2,536	5%▲
Library Media Center	2,875	3,262	12%▲
Physical Education*	4,430	**5,350**	17%▲
Multi-Purpose Room*	4,135	4,596	10%▲
Kitchen*	1,372	1,380	1%▲
Administration	1,765	1,828	3%▲
Counseling Suite	320	350	9%▲
Staff Development Area	600	650	8%▲
Health Services Suite	710	750	5%▲
Staff Areas	750	800	6%▲
Building Support Factilities	1,885	3,134	40%▲
Building Support Areas	600	723	17%▲
Pool & Locker Rooms**	0	0	-
Total Proposed (NSF) =	49,512		
Total Options =		53,803	
Variance (%)=		8.67%	
Total Buidling Gross SF (BGSF) =	102,461	103,034	

GENERAL NOTES
*When utilizing the existing footprint of the gymnasium/multi-purpuse/platform/kitchen is being maintained (shown with BOLD text). Exisiting footprint is oversized when compared to the proposed program.
** Exisiting pool footprint is being maintained (shown with BOLD text). Pool scope is not part of proposed program.

Parking Spaces Required: 80
Parking Spaces Provided: 45
Bus Queuing Provided: 3

Advantages:

- Maintains larger gymnasium
- The floor levels were re-stacked, eliminating the split level. This improved interior visibility and security
- Library location (first floors) is easily accessible and secure from the rest of the building after school hours
- Music is adjacent to Multi-purpose (performance platform)
- Adjacent park / playground are accessible
- Art has direct connection to outdoor space

Disadvantages:

- There is no secure separation between the pool facilities and the school
- Multiple loading / building service entrances
- Provides the fewest number of bus queuing spaces when compared to other options
- 45 of the 80 required parking spaces have been provided
- Limited bus queuing.
- The existing exterior walls limit opportunities for providing an energy efficient envelop, negatively impacting the energy efficiency of the mechanical systems
- Greatest construction cost/square foot

Option 3a:

A full renovation of the existing school + a larger addition/demotion (more than 50% of the existing building)

Renovation
Large Demolition
Large Addition

With Pool

Option 3a explores the renovation of more than 50% of the building with the implementation of a larger addition. This is achieved in Option 3a by maintaining the existing gymnasium and pool footprint along the hillside and creating a new four-story addition facing Maple Avenue.

The site renovation includes a wider parking area, expanding capacity to sixty spots along the front, and widening to student drop off area. The bus drop off then relegates to the western portion of the lot, allowing four buses to queue and load at a time. In the southern portion of the school, there is the potential for an amphitheater and stage to connect the adjacent park to a learning area directly behind the space. On the third floor, an extensive green roof expands to create an accessible connection to the park.

Option 3a

The addition along the first floor includes a new Administrative, Counseling, Health Services, and Staff Development wing with direct connection to the main entrance. The Administrative area is located immediately adjacent to the main entrance to provide direct security and visibility to those approaching and entering the school. The other half of the floor includes the Art, Music, and Dual-Purpose room wing with direct access to daylight and views.

The addition on the upper floors creates a rhythm of classroom neighborhoods integrated with collaboration space and natural daylight. The Library Media Center is then placed on the second floor with high ceilings to take advantage of all the windows, exterior views, and direct connection to the adjacent park.

Site Plan - Option 3a

Axon Diagrams - Option 3a

Level 1

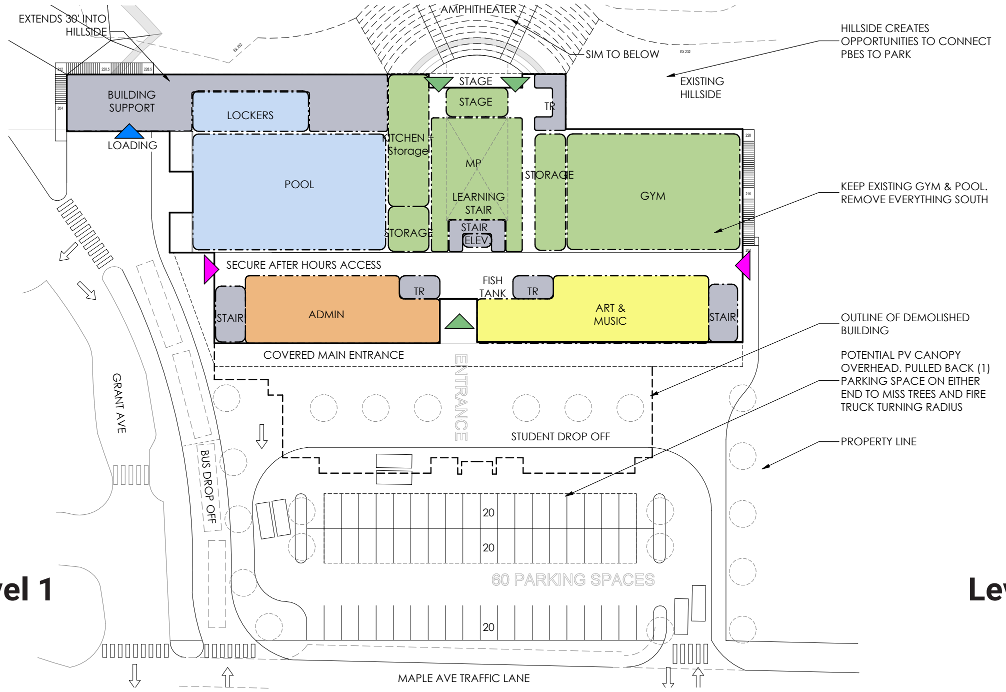
Level 2

Level 3

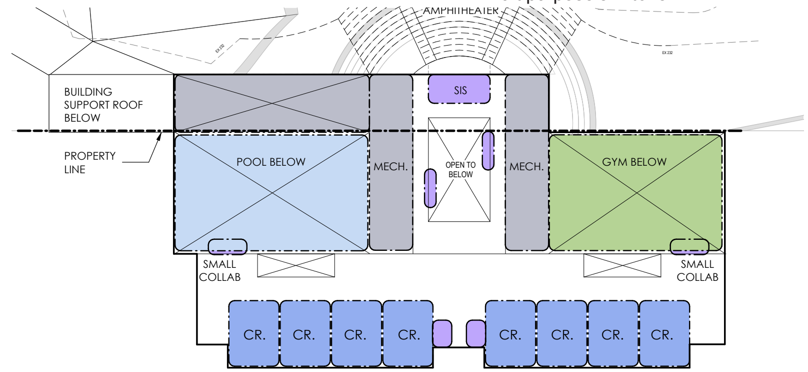
Level 4

Floor Plans - Option 3a

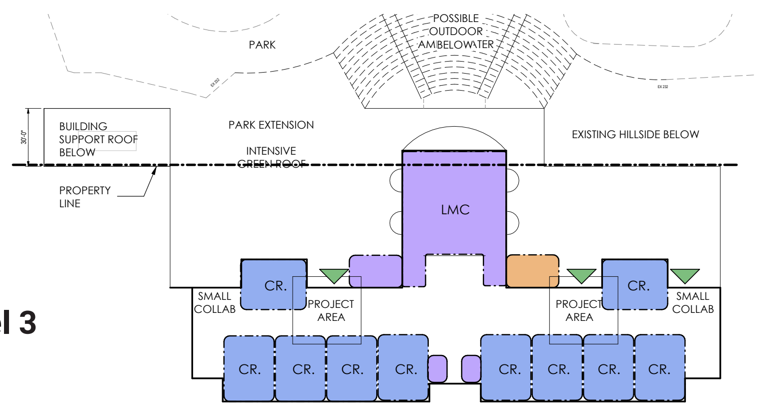
Classrooms | Administration | Music & Arts | Instructional Support | Building Support | Media Center, Phys. Ed., Multipurpose & Kitchen | Pool



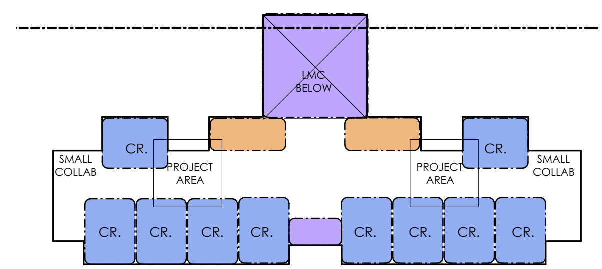
Level 1



Level 2



Level 3



Level 4

Primary Entry | Secondary Entry | Service

0' 50' 100' N

Option Analysis - Option 3a:

A full renovation of the existing school + a larger addition/demotion (more than 50% of the existing building)

Program Comparison:

Zone / Areas	Ed Spec	Option 3A (Pool)	Variance (%)
Classrooms	27,650	28,600	3%▲
Support Rooms	2,420	2,480	2%▲
Library Media Center	2,875	**3,175**	9%▲
Physical Education*	4,430	**6,226**	29%▲
Multi-Purpose Room*	4,135	4,301	4%▲
Kitchen*	1,372	1,437	5%▲
Administration	1,765	1,883	6%▲
Counseling Suite	320	320	0%▲
Staff Development Area	600	600	0%▲
Health Services Suite	710	710	0%▲
Staff Areas	750	750	0%▲
Building Support Factilities	1,885	1,885	0%▲
Building Support Areas	600	600	0%▲
Pool & Locker Rooms**	0	**8,291**	100%▲
Total Proposed (NSF) =	49,512		
Total Options =		61,258	
Variance (%)=		23.72%	
Total Buidling Gross SF (BGSF) =	102,461	98,622	

GENERAL NOTES

*When utilizing the existing footprint of the gymnasium/multi-purpuse/platform/kitchen is being maintained (shown with BOLD text). Exisiting footprint is oversized when compared to the proposed program.

** Exisiting pool footprint is being maintained (shown with BOLD text). Pool scope is not part of proposed program.

Parking Spaces Required: 80

Parking Spaces Provided: 60

Bus Queuing Provided: 4

Advantages:

- Maintains larger gymnasium
- Music is near the Multi-purpose (performance platform)
- School is separate and secure from pool facilities
- Adjacent park / playground are accessible
- Consolidated loading / building services
- Building footprint / layout provides space for open collaboration adjacent to classrooms

Disadvantages:

- Library location (upper floors) is not easily accessible and secure from the rest of the building after school hours
- 60 of the 80 required parking spaces have been provided
- Limited bus queuing

Option 3b:

A full renovation of the existing school + a larger addition/demotion (more than 50% of the existing building) without pool

Renovation
Large Demolition
Large Addition

Without Pool

Option 3b follows a similar planning logic to 3a, however, with the pool removed and the found space becoming the Multipurpose and Kitchen. The gym stays in place, keeping the existing building footprint along the hillside and adds a two-story addition facing Maple Avenue.

Alongside the front of the building, the parking lot extends to allocate for the required count of 80 parking spaces, with four bus spaces in front of the main entrance. To the west of the parking lot, the student drop off area alongside Maple Avenue creates a separate but connected space that allows unloading access to the main entry.

The green roof and park extension on the third floor create an opportunity for learning and connection to the Takoma-Piney Branch Park that removes the existing stairs and allows for an accessible throughway.

The addition on the first floor offers a new central location for all the administrative functions and the inclusion of an Art and Music wing. The upper classroom floors create neighborhoods for grades that are interconnected with the Library Media Center. Three breakout collaboration areas are located on the third level to allow flexible instruction.

Site Plan - Option 3b

Axon Diagram - Option 3b

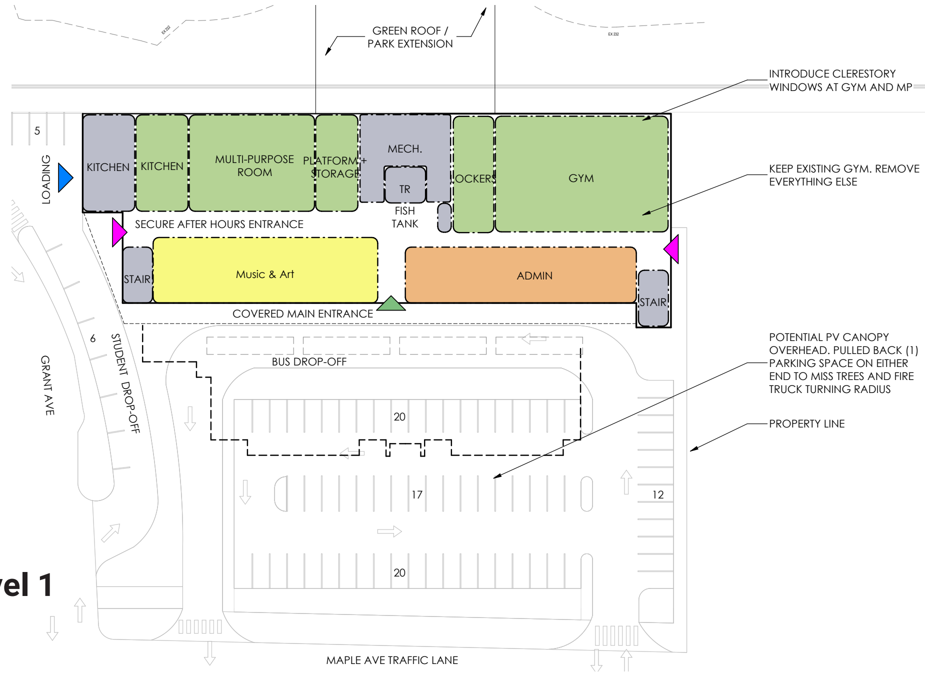
Level 1

Level 2

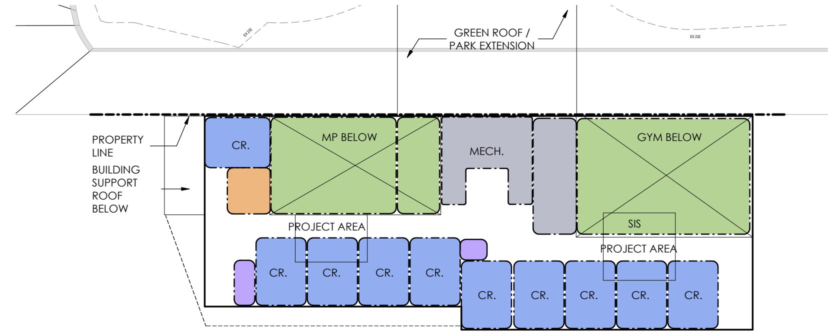
Level 3

Floor Plans - Option 3b

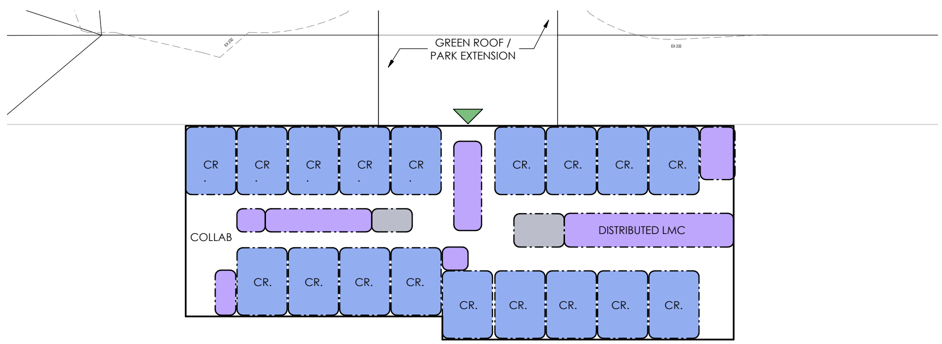
Classrooms | Administration | Music & Arts | Instructional Support | Building Support | Media Center, Phys. Ed., Multipurpose & Kitchen | Pool



Level 1



Level 2



Level 3

Primary Entry | Secondary Entry | Service

0' 50' 100'

N

Option Analysis - Option 3b:

A full renovation of the existing school + a larger addition/demotion (more than 50% of the existing building) without pool

Program Comparison:

Zone / Areas	Ed Spec	Option 3B (No Pool)	Variance (%)
Classrooms	27,650	28,662	4%▲
Support Rooms	2,420	2,400	-1%▼
Library Media Center	2,875	2,865	-0%▼
Physical Education*	4,430	**6,642**	33%▲
Multi-Purpose Room*	4,135	4,343	5%▲
Kitchen*	1,372	1,350	-2%▼
Administration	1,765	1,765	0%▲
Counseling Suite	320	320	0%▲
Staff Development Area	600	600	0%▲
Health Services Suite	710	710	0%▲
Staff Areas	750	750	0%▲
Building Support Factilities	1,885	1,885	0%▲
Building Support Areas	600	600	0%▲
Pool & Locker Rooms**	0	0	-
Total Proposed (NSF) =	49,512		
Total Options =		52,892	
Variance (%)=		6.83%	
Total Buidling Gross SF (BGSF) =	102,461	78,783	

GENERAL NOTES

*When utilizing the existing footprint of the gymnasium/multi-purpuse/platform/kitchen is being maintained (shown with BOLD text). Exisiting footprint is oversized when compared to the proposed program.

** Exisiting pool footprint is being maintained (shown with BOLD text). Pool scope is not part of proposed program.

Parking Spaces Required: 80

Parking Spaces Provided: 80

Bus Queuing Provided: 6

Advantages:

- Maintains larger gymnasium
- Music is near the Multi-purpose (performance platform)
- Adjacent park / playground are accessible
- Compact footprint creates space for more parking
- Bus circulation does not share exit with loading / service area
- Parking count meets the educational specification requirements
- Compact footprint reduces extent of building envelop (as compared to other options), increasing opportunities for greater energy efficient mechanical systems

Disadvantages:

- Library location (upper floors) is not easily accessible and secure from the rest of the building after school hours. and the school
- Library design is integrated into and open to the common space on level 3
- Compact footprint limits opportunities for open collaboration space adjacent to classrooms
- Limited parent pick-up/drop off queuing
- Compact footprint limits area available for renewable energy systems (i.e photovoltaic panels)

Option 4a:

A full demolition of the existing school + a brand new school (on existing site)

No Renovation
Complete Demolition
New School

With Pool

Option 4 involves the full demolition of the existing facility to construct a new school building on the same site. The entirety of required building elements described in the educational specifications are accounted for and included in this new space, with the addition of a new pool.

4a includes the pool and gym in the eastern portion of the first floor, with direct access to the Multipurpose and Kitchen area, as well as the Music and Art blocs. The Library Media Center extends vertically to the second floor, creating a physical connection between the floors, as well as visibility. A courtyard on the third floor creates additional outdoor learning opportunities and begins the connection to the adjoining park. The green roof sits to the west on this floor directly above the gym and pool area and provides potential space for outdoor learning opportunities beyond the park.

The parking lot alongside the front portion of the school allows for 52 spots, and additional parking near the loading area in the western corner creates 7 more. The bus drop-off portion has space for 3 buses to enter and exit along Maple Avenue. Pedestrians have a safe pathway to enter the school at the corner of Grant Avenue and Maple Avenue.

Site Plan - Option 4a

Axon Diagrams - Option 4a

Level 1

Level 2

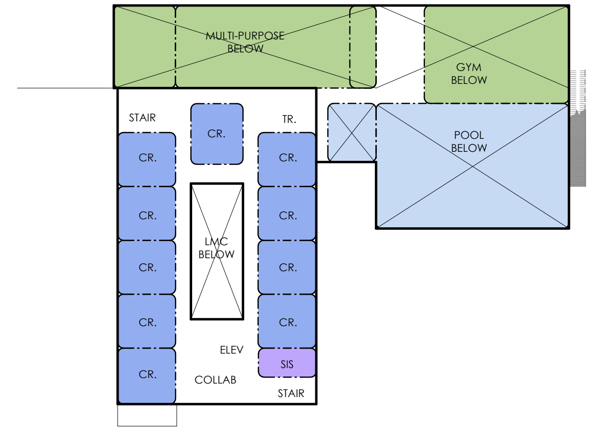
Level 3

Level 4

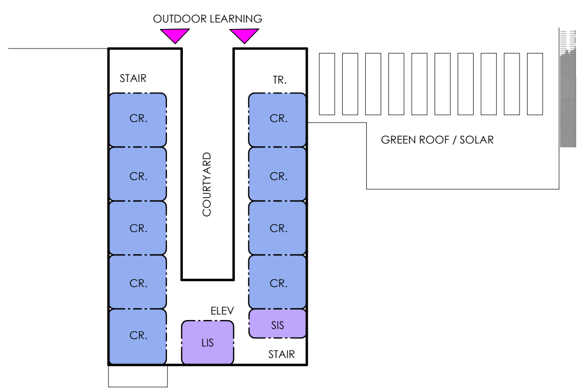
Floor Plans - Option 4a

Classrooms | Administration | Music & Arts | Instructional Support | Building Support | Media Center, Phys. Ed., Multipurpose & Kitchen | Pool

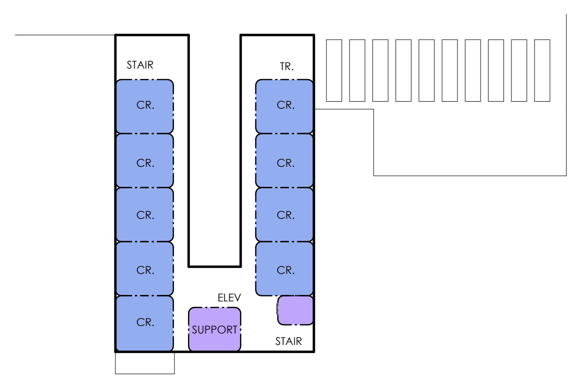
Level 1



Level 2



Level 3



Level 4

Primary Entry | Secondary Entry | Service

0' 50' 100'

N

Option Analysis - Option 4a:
A full demolition of the existing school + a brand new school (on existing site)

Program Comparison:

Zone / Areas	Ed Spec	Option 4A (Pool)	Variance (%)
Classrooms	27,650	27,605	-0%▼
Support Rooms	2,420	2,423	0%▲
Library Media Center	2,875	2,734	-5%▼
Physical Education*	4,430	4,565	3%▲
Multi-Purpose Room*	4,135	4,462	7%▲
Kitchen*	1,372	1,372	0%▲
Administration	1,765	1,777	1%▲
Counseling Suite	320	320	0%▲
Staff Development Area	600	600	0%▲
Health Services Suite	710	710	0%▲
Staff Areas	750	750	0%▲
Building Support Facilities	1,885	1,887	0%▲
Building Support Areas	600	680	12%▲
Pool & Locker Rooms**	0	**7,261**	100%▲
Total Proposed (NSF) =	49,512		
Total Options =		57,146	
Variance (%)=		15.42%	
Total Buidling Gross SF (BGSF) =	102,461	80,743	

GENERAL NOTES
*When utilizing the existing footprint of the gymnasium/multi-purpuse/platform/kitchen is being maintained (shown with BOLD text). Exisiting footprint is oversized when compared to the proposed program.
** Exisiting pool footprint is being maintained (shown with BOLD text). Pool scope is not part of proposed program.

Parking Spaces Required: 80
Parking Spaces Provided: 59
Bus Queuing Provided: 3

Advantages:

- Music is near the Multi-purpose (performance platform)
- Grade "neighborhoods" are separated by floor
- Adjacent park / playground are accessible
- Compact footprint creates space for more parking
- Bus circulation does not share exit with loading / service area
- Longest parent pick-up/drop off queuing of any option
- School is separate and secure from pool facilities
- Courtyard creates secure outdoor learning space
- Library location (first floors) is easily accessible and secure from the rest of the building after school hours
- New building provides opportunities to maximize energy efficient design principles

Disadvantages:

- Compact classroom bar limits opportunities for open collaboration space adjacent to classrooms
- Limited bus queuing
- 59 of the 80 required parking spaces have been provided
- Parking is distributed on-site
- 4-story building

Option 4b

A full demolition of the existing school + a brand new school (on existing site) without pool

No Renovation
Complete Demolition
New School

Without Pool

Following the aforementioned option, Option 4b is a full demolition of the current space, allowing for all required educational specifications to be fulfilled. This four-story space creates more parking for staff and members of the public, utilizes more classroom space, and keeps the Library Media Center at the heart of the building.

Along the first floor, the administrative and health suite sits at the front of the school, with the Learning Media Center directly adjacent. On the other side of the Learning Media Center, the Art and Music wing maintai direct access to the Multipurpose room that nestles in the northeastern portion of the building, with the Gym directly below. Levels 2, 3, and 4 house the three grades, with relevant support on each floor. An outdoor courtyard sits above the LMC, creating outdoor learning opportunities as well as outdoor views and connections on the floors above.

Option 4b

The new site includes 78 parking spaces, with a bus queue area allowing for 4 buses to drop students off alongside the main entrance. Loading and receiving sits directly next to the gym in the northeastern corner, and an outdoor arts terrace is created on the mirroring corner. On level three, an outdoor learning space sits atop the roof and along the northern back side of the building, with a direct connection to the park. This green roof and courtyard expand learning opportunities outside the classroom, while also maintaining an accessible entrance to the park.

Since Option 4b does not have a pool and the required associated support space, the footprint of this option can be reduced, making this option the smallest of all the options included in the study.

Site Plan - Option 4b

Axon Diagrams - Option 4b

Level 1

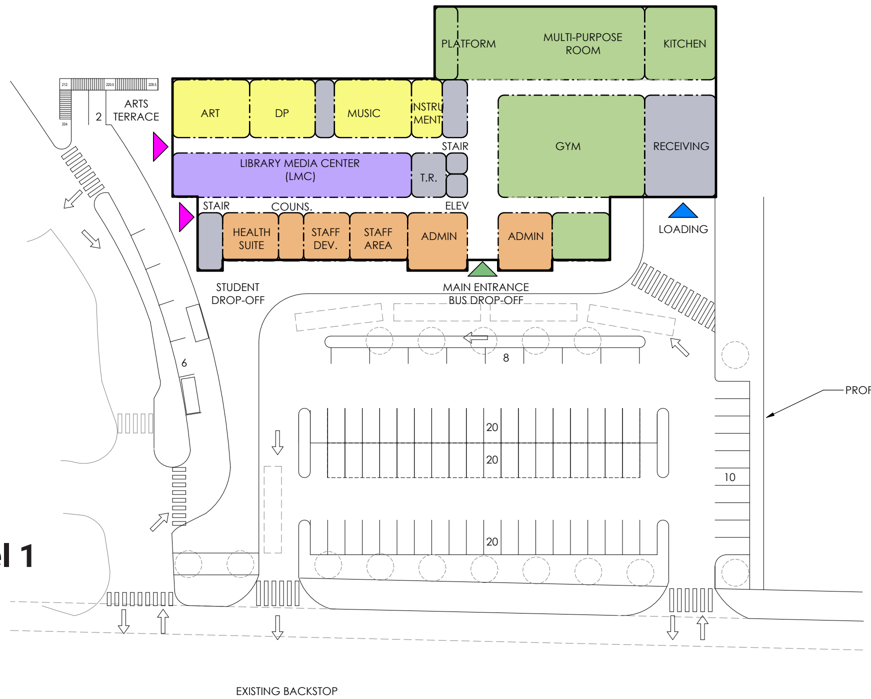
Level 2

Level 3

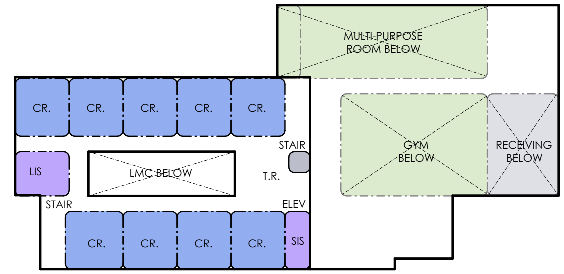
Level 4

Floor Plans - Option 4b

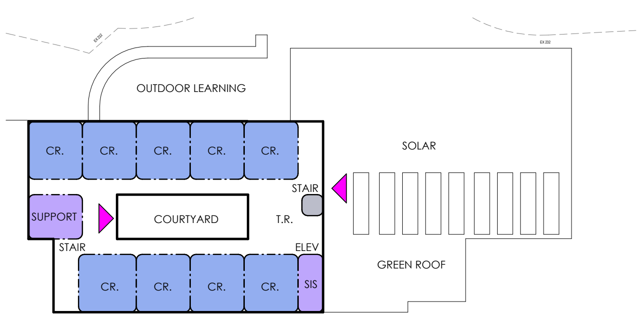
Classrooms | Administration | Music & Arts | Instructional Support | Building Support | Media Center, Phys. Ed., Multipurpose & Kitchen | Pool



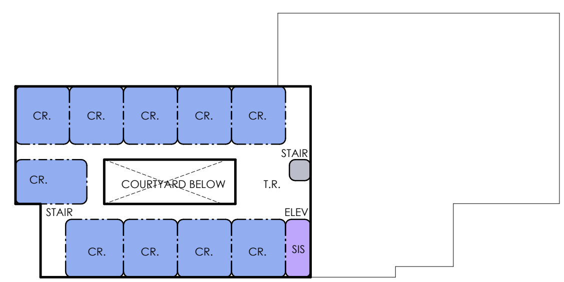
Level 1



Level 2



Level 3



Level 4

Primary Entry | Secondary Entry | Service

0' 50' 100'

N

Option Analysis - Option 4b:

A full demolition of the existing school + a brand new school (on existing site) without pool

Program Comparison:

Zone / Areas	Ed Spec	Option 4B (No Pool)	Variance (%)
Classrooms	27,650	27,611	-0%▼
Support Rooms	2,420	2,460	2%▲
Library Media Center	2,875	2,852	-1%▼
Physical Education*	4,430	4,778	7%▲
Multi-Purpose Room*	4,135	4,142	0%▲
Kitchen*	1,372	1,406	2%▲
Administration	1,765	1,770	0%▲
Counseling Suite	320	325	2%▲
Staff Development Area	600	600	0%▲
Health Services Suite	710	725	2%▲
Staff Areas	750	750	0%▲
Building Support Factilities	1,885	1,954	4%▲
Building Support Areas	600	680	12%▲
Pool & Locker Rooms**	0	0	-
Total Proposed (NSF) =	49,512		
Total Options =		50,053	
Variance (%)=		1.09%	
Total Buidling Gross SF (BGSF) =	102,461	69,384	

GENERAL NOTES
*When utilizing the existing footprint of the gymnasium/multi-purpuse/platform/kitchen is being maintained (shown with BOLD text). Exisiting footprint is oversized when compared to the proposed program.
** Exisiting pool footprint is being maintained (shown with BOLD text). Pool scope is not part of proposed program.

Parking Spaces Required: 80
Parking Spaces Provided: 78
Bus Queuing Provided: 3

Advantages:

- Music is near the Multi-purpose (performance platform)
- Library location (first floors) is easily accessible and secure from the rest of the building after school hours
- Grade "neighborhoods" are separated by floor
- Adjacent park / playground are accessible
- Compact footprint creates space for more parking
- Bus circulation does not share exit with loading / service area
- New building provides opportunities to maximize energy efficient design principles
- Smallest building square footage of all the options
- Courtyard creates secure outdoor learning space

Disadvantages:

- Compact classroom bar limits opportunities for open collaboration space adjacent to classrooms
- 78 of the 80 required parking spaces have been provided
- Limited parent pick-up/drop off queuing
- 4-story building

VI. Proposed Implementation Schedule

Proposed Schedule

1. **July, 2025:**	Feasibility Study Completion + October, 2025 Superintendent recommendation
2. **November, 2025**	Public hearings
3. **November, 2025**	Board of Education action on CIP
4. **May, 2026**	County Council adoption of CIP
5. **July, 2026**	Funding becomes available for projects that are approved to move forward into design and construction
6. **TBD:**	Start of Design
7. **TBD:**	Bidding
8. **TBD:**	Construction Completion

Appendix A - Space Allocation Summary

Appendix A - Space Allocation Summary

ES Enrollment	Capacity 640 Spaces	PBES Ed Spec Metrics UNIT Net Area (nsf)	PBES Ed Spec Metrics Total Net Area (nsf)
Classroom			
Standard	28	*850*	23,800
Art	1	*1,200*	1,200
Music	1	*1,200*	1,200
Instrumental Music Room	1	*450*	450
Dual Purpose Room	1	*1,000*	1,000
TOTAL CLASSROOMS	**32**	3,850	**27,650**
Support Rooms			
Large Instructional Support Room	1	*550*	550
Small Instructional Support Room	2	*425*	850
Speech / Language Room	1	*250*	250
Therapy / Support Room	1	*250*	250
Personal Care Room	1	*100*	100
Testing / Conference Room	1	*140*	140
Support Staff Offices	2	*140*	280

ES Enrollment	Capacity 640 Spaces	PBES Ed Spec Metrics UNIT Net Area (nsf)	PBES Ed Spec Metrics Total Net Area (nsf)
TOTAL SUPPORT ROOMS	**9**		**2,420**
Library Media Center			
Learning Environment	1	*2,100*	2,100
Work and Production Area	1	*475*	475
LMC Storage Room	1	*300*	300
TOTAL LIBRARY MEDIA CENTER	**3**		**2,875**
Physical Education			
* Gymnasium	1	*3,700*	3,700
Office	1	*140*	140
Storage	1	*250*	250
Storage	2	*100*	200
Outside Storage	1	*140*	140
TOTAL PHYSICAL EDUCATION	**6**		**4,430**

Appendix A - Space Allocation Summary

ES Enrollment	Capacity 640	PBES Ed Spec Metrics	
	Spaces	UNIT Net Area (nsf)	Total Net Area (nsf)
Multipurpose Room			
Multipurpose Room	1	3,200	3,200
Chair Storage	1	180	180
Table Storage	1	180	180
Platform	1	450	450
Before/After Care Prep Area	1	25	25
Before/After Care Storage	1	100	100
TOTAL MULTI-PURPOSE ROOM	6		4,135
Kitchen			
Serving Area	1	300	300
Walk-In Cooler/Freezer	1	155	155
Dry Storage	1	192	192
Office	1	100	100
Toilet Room	1	70	70
Preparation Area	1	555	555
TOTAL KITCHEN	6		1,372

ES Enrollment	Capacity 640	PBES Ed Spec Metrics	
	Spaces	UNIT Net Area (nsf)	Total Net Area (nsf)
Administration			
General Office	1	500	500
Workroom	1	300	300
Principal's Office	1	250	250
Assistant Principal's Office	1	140	140
Conference Room	1	275	275
Storage	1	100	100
Record Room	1	75	75
Toilet Room	1	50	50
2nd Floor Workroom	1	75	75
TOTAL ADMINISTRATION	9		1,765
Counseling Suite			
Counselor's Office	1	160	160
Itinerant Staff Office	1	160	160
TOTAL	2		320

Appendix A - Space Allocation Summary

ES Enrollment	Capacity 640	PBES Ed Spec Metrics	
	Spaces	UNIT Net Area (nsf)	Total Net Area (nsf)
Staff Development Area			
Staff Development Office	1	*100*	100
Reading Specialist Office	1	*100*	100
Training / Conference Room	1	*400*	400
Storage	0	*0*	0
TOTAL	**3**		**600**
Health Services Suite			
Waiting Area	1	*100*	100
Treatment / Medication Area	1	*120*	120
Office / Health Assessment Room	1	*100*	100
Health Assessment / Isolation Room	1	*100*	100
Rest Area	1	*200*	200
Toilet Room	1	*50*	50

ES Enrollment	Capacity 640	PBES Ed Spec Metrics	
	Spaces	UNIT Net Area (nsf)	Total Net Area (nsf)
Storage Room	1	*40*	40
TOTAL	**7**		**710**
Staff Areas			
Staff Lounge	1	*650*	650
Privacy Room	2	*50*	100
TOTAL	**3**		**750**
Building Services Facilites			
Building Services Office	1	*140*	140
Locker / Shower Area	1	*150*	150
Compactor / Trash Room	1	*150*	150
General Storage and Receiving	1	*550*	550
General Storage	3	*240*	720

Appendix A - Space Allocation Summary

ES Enrollment	Capacity 640	PBES Ed Spec Metrics	
	Spaces	UNIT Net Area (nsf)	Total Net Area (nsf)
Building Services Outdoor Storage	1	*175*	175
TOTAL	**8**		**1,885**
Building Support Areas			
Book Storage	1	*200*	200
PTA Storage	1	*100*	100
Telecommunication Closet	1	*150*	150
Telecommunication Closet	3	*50*	150
TOTAL	**6**		**600**

1

ES Enrollment	Capacity 640	PBES Ed Spec Metrics	
	Spaces	UNIT Net Area (nsf)	Total Net Area (nsf)
Pool			
Pool	0	*0*	0
Office	0	*0*	0
Storage	0	*0*	0
Vestibule	0	*0*	0
Pump Room	0	*0*	0
Locker Room	0	*0*	0
Locker / Mech Room	0	*0*	0
TOTAL POOL AREAS	**0**		**0**
Mechanical/Plumbing Room (Main)	1	900	
Electrical Room (Main)	1	450	
Electrical Closets	4	75	
Generator (Outside)	1		
Emergency Room	1	125	
BUILDING TOTALS	**100**		**49,512**

Appendix B - Educational Specifications

Table of Contents

Space Summary

Facility	#	Description	Net Sq. Ft.	Total Net Sq. Ft.
Classrooms				26,650
Standard	28	Includes 150 s.f. storage	850	23800
Art	1	Includes 250 s.f. storage	1200	1200
Music	1	Includes 250 s.f. storage	1200	1200
Instrumental Music Room	1		450	450
Dual purpose Room	1		1000	1000
Support Rooms				2,420
Large Instructional Support Room	1		550	550
Small Instructional Support Room	2		425	850
Speech/Language Room	1		250	250
Therapy/Support Room	1		250	250
Personal Care Room	1		100	100
Testing/Conference Room	1		140	140
Support Staff Offices	2		140	280
Library Media Center				2,875
Learning Environment	1		2100	2100
Work and Production Area	1		475	475
LMC Storage Room	1		300	300
Physical Education				4,430
Gymnasium	1		3700	3700
Office	1		140	140
Storage	1		250	250
Storage	2		100	200
Outside Storage	1		140	140
Multipurpose Room				4,135
Multipurpose Room	1		3200	3200
Chair Storage	1		180	180
Table Storage	1		180	180
Platform	1		450	450
Before/After Care Prep Area	*1*		*25*	*25*
Before/After Care Storage	*1*		*100*	*100*

Facility	#	Description	Net Sq. Ft.	Total Net Sq. Ft.
Kitchen				1,372
Serving Area	1		300	300
Walk-in Cooler/Freezer	1		155	155
Dry Storage	1		192	192
Office	1		100	100
Toilet Room	1		70	70
Preparation Area	1		555	555
Administration				1,765
General Office	1		500	500
Workroom	1		300	300
Principal's Office	1		250	250
Assistant Principal's Office	1		140	140
Conference Room	1		275	275
Storage	1		100	100
Record Room	1		75	75
Toilet Room	1		50	50
2nd Floor Workroom	1		75	75
Counseling Suite				320
Counselor's Office	1	Needs to fit an L-shaped desk, round table, 4 chairs	160	160
Itinerant Staff Office	1	Needs to fit an L-shaped desk, round table, 4 chairs	160	160
Staff Development Area				600
Staff Development Office	1		100	100
Reading Specialist Office	1		100	100
Training/Conference Room	1		400	400
Health Services Suite				710
Waiting Area	1		100	100
Treatment/Medication Area	1		120	120
Office/Health Assessment Room	1		100	100
Health Assessment/Isolation Room	1		100	100
Rest Area	1		200	200
Toilet Room	1		50	50
Storage Room	1		40	40
Staff Areas				750
Staff Lounge	1		650	650
Privacy Room	2		50	100
Building Service Facilities				1,885
Building Services Office	1		140	140
Locker/Shower Area	1		150	150
Compactor/Trash Room	1		150	150
General Storage and Receiving	1		550	550
General Storage	3		240	720
Building Services Outdoor Storage	1		175	175
Building Support Areas				600
Book Storage	1		200	200
PTA Storage	1		100	100
Telecommunication Closet	1		150	150
Telecommunication Closet	3		50	150
Total	**32**			**48,512**

Introduction

- ☐ This document describes the facilities that are needed for the Piney Branch Elementary School educational program. The descriptions below will provide the architect with important guidelines and staff will be used by staff representatives to review drawings for the facility.

- ☐ This school will be designed with a capacity for 644 students, a core capacity for 640 students. There is no scheduled completion date at this time.

- ☐ The educational specifications are divided into three sections.
  - The first section, the space summary, lists the type of spaces and square footage required when the project is complete.
  - The second section describes the general design, location, and specific requirements for each type of space in accordance with Montgomery County Public Schools (MCPS) standards.
  - The third section identifies additional program requirements for the school.

- ☐ The architect should show the location for relocatable classrooms, should they be required in the future. These units should be sited in a location where it will not cause conflict with the constructability of a future addition. The necessary utility connections, i.e. electrical power, fire alarm, public address, and data should be provided near the future location of relocatable classrooms.

- ☐ The architect will provide a space summary comparison between the programmed space requirements and the proposed after each phase of the project including but not limited to the schematic design, design development, and final design phase.

- ☐ The design of the school should promote a collaborative approach for both teaching and learning. Flexibility of design should be provided to accommodate changing educational programs and pedagogy.

- ☐ The project will be designed to the meet current local and state sustainability guidelines.

General Planning Considerations

In the general planning of this building, special consideration is to be given to the following comments and instructions:

Code and Guidelines

☐ The architect is expected to become thoroughly familiar with all national, state and local fire safety, life safety, and health code regulations and to follow applicable rules of the State Interagency Committee on School Construction.

☐ The building is to be accessible to the disabled within the meaning of the latest edition of the Americans with Disabilities Act and to conform to all the latest requirements of the *Americans with Disabilities Act Standards for Accessible Design*. (The regulation can be found at https://www.ada.gov/2010ADAstandards_index.htm)

☐ In addition to the ADASAG, the *Maryland Accessibility Code* (COMAR.05.02.02) also is required for public schools. (The regulation can be found at http://mdcodes2.umbc.edu/dhcd/access.htm).
Per COMAR 23.03.02: Regulation .29, all high school projects that include replacing or upgrading the electrical system should be designed and constructed sot that a designated public shelter area can be fully powered in the event of an emergency.

☐ The architect should refer to the MCPS Facility Guideline Specifications when noted. The Document can be found at: http://www.montgomeryschoolsmd.org/departments/construction/publications/guidelines.shtm

☐ Special consideration should be given to energy conservation including total life-cycle costs. The current Department of General Service (DGS) requirements shall be applied as design criteria. Life-cycle cost accounting in accordance with DGS criteria is required. A statement on energy conservation must be a part of the preliminary plans submission. Additional details on energy conservation will be provided under separate cover.

☐ The architect should refer to MSDE 2006 *Classroom Acoustic Guidelines* to address the acoustical qualities for classrooms. Core learning spaces should include sound-absorptive finishes for compliance with reverberation time requirements as specified in ANSI, *Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools* (ANSI S12.60-2002.)

☐ High quality materials are to be used in the construction. The architect should refer to the MCPS Facility Design Guidelines.

Educational Considerations

☐ The school should be designed to support flexible and collaborative learning environments. When possible, the architect should identify collaborative work spaces throughout the building. These spaces can be located near the instructional spaces as well as informal areas such as the library, hallways, etc.

- ☐ All spaces should be designed in such a way that can be adapted to changes in pedagogical changes in the future.
- ☐ The classrooms should be designed to accommodate various size groups. Each classroom should be readily adaptable for group work, various presentation formats, and should have maximum connectivity to outside resources.
- ☐ The shape of the classroom and the design of built-in features and storage areas should provide optimum net usable floor area. Elongated rooms and features that protrude into floor area, limiting flexibility, are to be discouraged. Rectangular shaped classrooms are preferred.
- ☐ For maximum instructional flexibility, large special instruction areas such as those provided for general music and multipurpose laboratories should be designed to allow easy conversion of some or all of the space for other kinds of instruction in the future
- ☐ Every teaching station, support space, and core area must be wired for computer and VOIP telephone, along with adequate electrical supply in compliance with Maryland Sate design guidelines for Technology in Schools and the MCPS Office of Technology and Innovation (OTI) guidelines. Facilities must be adaptable to accommodate rapid development in high technology and its equipment since educational program and organization in this field are dynamic. Space and power supply must be flexible to meet these changing needs.

Facility Considerations

- ☐ The architect is to design the spaces within 5 percent (plus/minus) of the net square foot guidelines provided in this document unless otherwise noted.
- ☐ The first impression of a building is important. The main entrance to the school should have a clear and inviting identity, and the architect should emphasize the entrance area through its design and landscape.
- ☐ The facility is to reflect an appealing visual, acoustic, and thermal environment and is to be properly furnished and equipped. Well-chosen colors and textures should be used.
- ☐ The design of the main lobby area needs to convey a feeling of warmth and welcome. The inclusion of a lighted showcase in which student work can be displayed is recommended.
- ☐ The main lobby should have a large overhead-animated electronic display board for messages and videos.
- ☐ Lighting must meet current guidelines and provide adequate levels.
- ☐ Carpeting should be limited to the principal's office, assistant principal's office and conference room in the administration suite and the main reading room of the library media center (LMC).

- ☐ The inclusion of lighted showcases to display student work should be provided in the corridors of the main entrance, art, technology education, gymnasium, and in each grade level area. They should be recessed into the wall with access from within a room and have an electric outlet.
- ☐ Staff work areas should be arranged to encourage interdisciplinary interaction.
- ☐ Noise and distracting sounds are to be minimized. In areas such as the multipurpose room and classrooms, which may be used for meetings and adult education, the sound of operating fans for ventilation should not interfere with instruction.
- ☐ A MCPS-designed alarm system will provide security for this facility. The architect will provide for this system in consultation with the Division of Design and Construction (DDC) staff.
- ☐ Some windows must be operable in each space in the building. Transmission of radiation through windows into various portions of the plant is to be considered in relation to heating and ventilating and in relation to planning the building for air conditioning. All instructional spaces should have windows, preferably exterior windows. If the design does not permit exterior windows, windows onto corridors should be provided.
- ☐ All windows should be equipped with window coverings. The specification for the window coverings will be provided by DDC. Screens on operable windows should be installed in all food related areas.
- ☐ Careful placement of glass is required to avoid excess heat gain in occupied areas.
- ☐ The entire school is to be air-conditioned.
- ☐ Zoning the plant for heating and air-conditioning should be related to after-hours use of various areas such as offices, gymnasium, multipurpose room, and the instructional media center. Appropriate location of parking, corridor barriers, and toilet rooms is necessary for after-hours use. Some classrooms nearby the multipurpose room should be zoned for after hour use as well.
- ☐ Core spaces such as the cafeteria, gymnasiums, and LMC should be easily accessible for community use and secure from the rest of the building after school hours.
- ☐ Special attention should be given to security measures within the building including location of security barriers in corridors, lockable doors to secure various sections of the building for after-hour use.
- ☐ Spaces that serve no real educational function, such as corridors, should be limited while at the same time assuring an easy to supervise and smooth flow of pupil traffic to and from the LMC, multipurpose room, gymnasium, specialized centers, and support rooms.
- ☐ For security purposes, all doors into classrooms, conference rooms, offices, etc. must be designed with a sidelight window with shades. If a sidelight is not possible, then the door requires a vision panel.

- ☐ Noise and distracting sounds are to be minimized. In areas such as the multipurpose room and classrooms, which may be used for meetings and adult education, the sound of operating fans for ventilation should not interfere with instruction.
- ☐ Some toilet rooms should be located so that they may be used during after-hour use.
- ☐ Bathrooms for staff and students should be located throughout the building. Some student bathrooms must be located near the cafeteria and gymnasiums.
- ☐ To the extent feasible, at least one inclusive restroom should be provided on each floor and in high-traffic areas for student use. These toilets should be designed with a non-locking door and one individual stall in each toilet room.
- ☐ Electric water bottle filling stations with filters should be strategically located throughout the building and close to the restrooms. All of the water coolers should have water bottle filling stations and should be located near high volume areas such as the cafeteria and gymnasium and on each floor.
- ☐ Corridors where lockers are installed must be a minimum of 10' in width.
- ☐ The number of lockers in the corridor should be equal to the core capacity plus 10% of the core capacity.
- ☐ The location of the elevator(s) must consider use by the student population, LMC staff, and after-hours users.
- ☐ A public address system is required in the facility. The architect and engineers should refer to the MCPS Facility Guideline Specifications for additional information.
- ☐ A building services call system is required.
- ☐ A room numbering system which is logical and understandable and which lends itself to electronic scheduling of room assignments for students is required.

Site Considerations

- ☐ A covered walkway from the bus loading area to the front door is desirable.
- ☐ The design of the building and grounds must provide for a secure environment for students and staff. Isolated areas should be minimized and natural surveillance encourage by eliminating visual barriers.
- ☐ Exterior lighting is to be shaded from neighboring properties and is to be operable as appropriate from both time and key switches. For major entrances, a doorbell should be installed.
- ☐ Separate controls on a time clock for illumination of walkways and parking lots, including parking areas for the stadium area are required.

- [ ] Landscaping and provision for outdoor watering are to be included. Planting is to include screen planting and those that may be needed for erosion control. Other landscaping to support energy conservation and to relate the building to the site with aesthetic appeal must be included.

Technology Framework

The latest technology should be integrated into every aspect of building. The architect should consult with the OTI and the DDC for the latest technology requirements. The architect must at a minimum plan for the following elements.

- ☐ With wireless access, local area and wide area computer and video networks, students should have access to each other, to schools throughout the county with similar capabilities, and to universities and government institutions throughout the world.
- ☐ Each classroom is to have one dedicated 20 amp electrical circuit for a charging mobile laptop cart.
- ☐ Each classroom will have an interactive teaching board at the teaching wall and computer network outlet (CNO) for the teacher's computer.
- ☐ Additional outlets to allow for charging of personal student devices should be provided in the classrooms and throughout the building.
- ☐ CNOs consisting of a flush mounted standard electrical box with 1 1/2" conduit to the ceiling space overhead should be located in all classrooms, offices, and other work locations according to the following general rules:
  - ☐ one CNO per office, staff office, planning room, etc. adjacent to telephone outlet
  - ☐ One CNO for VOIP system in the classroom
  - ☐ Two CNOs for student use located 3' apart along the back or side wall in each classroom.
  - ☐ Multiple CNOs in media center at circulation desk, reference areas, etc.
  - ☐ One CNO at each science lab workstation
  - ☐ All other areas such as the stage, bookstore, dining room, etc., where computers might be used.
- ☐ The number and location of telecommunication closets required to support the building-wide computer network is dependent on the size and geometry of the building. The layout of the telecommunication closets will be determined during the design phase of the project.
- ☐ Outdoor wireless access points need to be provided at the schools.
- ☐ Wireless access point needs to be provided at the main entrance of the school for a message board.
- ☐ CNOs for security cameras are required at the schools. The number and location will be determined during the design process.

Description of Facilities

Please refer to the summary of spaces in the front of this document for the square foot requirements for each space described below. Square foot allocations should be considered the standard to be followed, although minor deviations are permitted.

Standard Classroom

- ☐ Each classroom should be designed to support flexible furniture arrangements that will support a variety of teaching and learning models.
- ☐ 150 square feet of casework storage is needed in the classroom.
- ☐ The computers should not be located next to a marker board where magnets might damage the hardware and software. Glare from the windows on the computer screens should also be eliminated as much as possible. Security for the computers should be planned in consultation with the MCPS DDC. Computer/technology wiring must be in accordance with DDC/MSDE/OTI guidelines.
- ☐ Every classroom must have computer outlets for two student workstations and one teacher workstation. The building information and communications distribution system and other aspects of the building design must comply with the latest edition of MSDE *Maryland Public School Standards for Telecommunications Distribution System*.
- ☐ The architect should refer to the MCPS Facility Guideline Specifications for the main teaching wall layout.
- ☐ The remaining walls should be outfitted with magnetic maker board and a tack strip above.
- ☐ A small 4x4 tack board may be considered near the entrance of each classroom and will be discussed during the quarter scale review.
- ☐ Lockers will be provided in the hallway for storing student belongings. The architect should design the facility with 700 lockers if the core capacity is 640 and 815 lockers if the core capacity is 740.
- ☐ All classrooms should be equipped with an accessible sink.
- ☐ A storage area is needed to hold at least two science kits (approximate 27" x 17" x 12" each) and one math kit in each classroom.
- ☐ General storage space must be built in and must accommodate 24- by 36-inch paper and a 4-drawer file cabinet. Each classroom must include 48 linear feet of built-in adjustable shelving.
- ☐ A small lockable teacher's wardrobe must be provided, as per MCPS Facility Guideline Specifications.
- ☐ Designated shelf space, not near a window, for an aquarium/terrarium with nearby electrical outlet, is desirable.

- ☐ Each classroom should be equipped with window coverings or shades. The specifications for the window coverings will be provided by DDC.
- ☐ Battery operated clocks will be installed.
- ☐ A school may consider reducing the size of each classroom to create small break-out/collaborative rooms in the school. The number and design of these breakout/collaborative rooms may be determined by school and MCPS staff.

Special Education Classroom

- ☐ The specific requirements are the same as the requirements for standard classroom requirements. Please refer to the preceding section for these requirements.
- ☐ Please see the additional requirements section of document for additional special education program requirements specific to this school.

Art Room

The art room is to provide space for teaching and creating art, displaying student work and educational aids, and storing supplies and materials. The room should be designed as follows:

- ☐ The minimum square footage for the teaching area must be 800 square feet. The ideal room dimensions are approximately 25’ x 32’.
- ☐ The art room must not be carpeted.
- ☐ Both art and music rooms must be located near student restrooms.
- ☐ Two computer drops along wall for student use should be provided.
- ☐ The design of all work, display, and storage areas should create an environment that is functional and easy to clean.
- ☐ Lighting should be both natural and artificial and conducive to close work.
- ☐ A door to the outside is desirable.
- ☐ Space and electrical outlets for two kilns should be in the farthest corner of the storeroom with proper ventilation.
- ☐ Eight duplex electrical outlets are to be provided (where feasible quadruplex outlets may be utilized).
- ☐ Any available wall space should have tack boards.

The window wall should have the following:

- ☐ Windows that permit views of the surrounding landscape.
- ☐ Window coverings to permit room darkening.
- ☐ Shelves under windows 15” deep.
- ☐ Tack board or tack strips above windows if space permits.

The teaching wall should have the following:

- ☐ Standard teaching wall should be provided. The architect should refer to DDC standards.
- ☐ Fourteen-inch deep, 24 inch high, shelving under the center of the 16-foot long tack board and white board.

Sinks and sink area:

- ☐ Three sinks should be provided. Faucets should be accessible to students and positioned to prevent splashes onto floor.
  - ☐ One ADA accessible sink (34" high)
  - ☐ One sink located on a peninsula (30" high). Peninsula is to be no longer than 3 feet.
  - ☐ One 12" deep sink (32").
- ☐ Removable plaster traps
- ☐ Closed cabinets below and above
- ☐ Conveniently located towel and soap dispensers
- ☐ At least 9 feet of counter space (includes 1 ½ feet of counter space on both sides of the sinks) with rounded corners
- ☐ Hot and cold water faucets
- ☐ A tile backsplash that spans from the countertop to the bottom of the wall cabinets.
- ☐ Extra caulking where the countertop meets the backsplash.
- ☐ A 5- to 7-foot open space is needed for drying rack(s) along one wall.

The wall opposite or adjacent to the teaching station should have the following:

- ☐ One 6-foot tall, 12-foot long tack board with 24-inch tall, 14-inch deep shelving units below.

Art Storeroom

- ☐ The storeroom must be approximately 8.5-9' wide by approximately 25-30'.
- ☐ The storeroom must have a 6-foot wide, 30-inch tall, and 34-inch deep worktable immediately inside the entrance to the storeroom with 5-6 built-in sliding drawers. This table will accommodate a 30-inch square paper cutter and storage of large art reproductions and papers below.
- ☐ Three or four 6-foot tall, 36-inch wide paper storage shelf sections, 24" deep with shelves 8 inches on center to accommodate 18" x 24" paper.
- ☐ An empty floor space should be left to accommodate flat files. 5-drawer flat file units are 40 ¾"W x 15 3/8"H x 28 3/8"D x 2" drawer depth. Three of these 5-drawer units will be stacked on top of each other. (NIC)
- ☐ Empty floor space should be left to accommodate one rolling care and filing cabinet.

☐ All extra space should be filled storage shelving and cabinets. There should be no empty walls in the storage closet.

☐ Seven foot tall open shelving, 18 inches deep, should be provided along remaining walls where space permits. Twelve to fourteen inch deep sections are acceptable for some sections where 18-inch deep shelves won't fit.

☐ Teacher wardrobe should be provided in the storeroom.

Kiln Area

☐ The kiln area should be located at the far end of the storeroom and should accommodate two kilns.

☐ Two or three 7-foot tall, 18-inch deep, 36-inch wide shelf sections near kiln area for storage of ceramic work.

☐ Two kiln exhaust hoods and fans (local switch) must be installed with a 24 hour timer. Positive ventilation (using negative pressure) is needed to assure removal of fumes.

☐ Kilns should be 30 inches wide, 30 inches deep and 36 inches tall. Allow an additional 6 inches in depth for opening of the kiln lid.

☐ Electrical characteristics for the kiln are 250 volt, 50 amps, single phase, and 7200 watts. Provide 2-250V, 50 amp 3-prong plug outlets. NEMA configuration 6-50R. Provide two outlets on wall behind the kilns.

Hallway Outside

☐ The hallway outside of the art room should have two tack boards for displaying artwork. Tack strips also should be provided on other walls.

☐ There should be a lockable showcase with lights located near the art room or at the main entrance of the school.

Music Suite

Spatial Needs
Music Room
Instrumental Music Room
Music Storage Room

- ☐ The music room and instrumental music room should be located adjacent to each other with a shared storage room.
- ☐ These rooms should be located near the multipurpose room to allow easy access to the performance platform.
- ☐ The two music rooms must be acoustically treated for isolation and reverberation with a combination of absorptive and reflective acoustic wall panels, by Wenger or equal, to be included the base bid design.

Music Room

- ☐ The teaching area for the music room must be 34' x 31' and have a circle 20 feet in diameter, with chairs arranged around three sides of a surrounding box of the circle.
- ☐ 100 linear feet of general storage (casework throughout the classroom) is needed in the classroom. Adjustable, open shelving must allow for storage of books, CDs, and small instrument as follows:
  - ☐ 12" deep shelving for 140 books (140 linear inches)
  - ☐ 12" deep shelving for 13-15 baskets 12"x9" for small musical instruments
  - ☐ 12" deep shelving for four medium sized drums (12"x12"x12")
  - ☐ Two 18" deep shelves, 3' long for bass xylophones
  - ☐ 12" deep shelving, 42" long for 4 alto xylophones, 2 shelves high
  - ☐ 12" deep shelving, 42" long for 4-6 soprano xylophones, 3 shelves high
  - ☐ 12" deep shelving for 4 alto and 4 soprano glockenspiels
  - ☐ Some additional shelving for books, CDs, instruments, and teaching materials.
- ☐ The music room needs a child height sink.
- ☐ Window coverings will be provided for room darkening. If there is a roof monitor then window coverings are required.

- ☐ The architect should refer to the MCPS Facility Guideline Specifications for the main teaching wall layout. The teaching wall also should have a single music staff on both marker boards located on the upper third of the magnetic board.
- ☐ An additional 8'magnetic marker board should be provided in the classroom with a single music staff.
- ☐ Two 4' tack boards should be provided in the classroom.
- ☐ A minimum of eight duplex electrical outlets should be provided in the classroom. No fewer than four outlets should be located on the teaching wall, space out along the teaching wall.
- ☐ 36" wide doors into the music room and platform to accommodate the passage of a piano.
- ☐ Two speaker outlets and 12" deep shelves, installed 6' 8" high, should be located in the front of the classroom for speakers.
- ☐ Additional outlets should be provided throughout the room for use of instruments and sound system.
- ☐ The architect should show the location for an electronic keyboard at the main teaching wall.
- ☐ A location for a teacher's desk is required.
- ☐ A teacher's wardrobe is required.

Instrumental Music Room

- ☐ A deep sink and countertop area should be provided for cleaning and repairing musical instruments.
- ☐ 36" doors into the instrumental music room must be wide enough to accommodate the passage of piano and large instruments.

Music Storage Room

- ☐ A 250-square foot secure room to store instruments, equipment, choral and instrumental music, music stands, and instructional charts is necessary with access from the music room.
- ☐ Ideally, this room should be located between the general and instrumental music rooms with access from both rooms.
- ☐ 48"W x 24"D x 84"H wood cabinets with adjustable shelves and lockable doors should be provided in the instrumental storage room for the sound system. Some open adjustable shelving also should be provided. Specific storage and shelving specifications are available through Montgomery County Public School's MCPS Facility Guideline Specifications.

Dual Purpose Room

- ☐ This room should be designed to accommodate both art and music activities in the school but with less detail than the regular art and music rooms.
- ☐ Some acoustical treatment should be provided in the room.
- ☐ One sink designed at 34” should be provided along with some countertop area.
- ☐ No kiln area is needed and less shelving than described in the art room is to be provided.

Support Rooms

Spatial Needs
Large Instructional Support Room
Small Instructional Support Room
Speech/Language Room
Occupational Therapy/Physical Therapy (OT/PT) Room
Testing Room
Support Staff Offices
Parent Resource Room (For Title 1 Schools)

Large Instructional Support Room

- ☐ Room for a teacher's desk, lockable file cabinet, and assorted sized furniture is desired.
- ☐ This room should have computer outlets for two or three student workstations and one teacher workstation. The building information and communications distribution system and other aspects of the building design must comply with the latest edition of MSDE *Maryland Public School Standards for Telecommunications Distribution System*.
- ☐ The architect should refer to the MCPS Facility Guideline Specifications for the main teaching wall layout.
- ☐ The remaining walls should be outfitted with magnetic maker board and a tack strip above.
- ☐ A small 4x4 tack board may be considered near the entrance of each classroom and will be discussed during the quarter scale review.
- ☐ Each classroom must include a minimum of 50 linear feet of built-in adjustable shelving for books.
- ☐ Space for a big book rack should with an incline to display the book open and also for storage beneath for space to lay the books flat should be provided.
- ☐ A small lockable teacher's wardrobe must be provided, as per MCPS Facility Guideline Specifications.
- ☐ 40 mailboxes should be designed for storage of student work such as folders or notebooks.
- ☐ This classroom should be equipped with a handicapped accessible sink. Cabinets should be provided above and below the counter area.
- ☐ Each classroom should be equipped with window coverings. DDC will provide the specifications for the window coverings.
- ☐ Battery operated clocks will be installed. The clock should not be mounted behind the projection screen.

Small Instructional Support Room

- ☐ Room for a teacher's desk, lockable file cabinet, and assorted sized furniture is desired.
- ☐ This room should have computer outlets for two or three student workstations and one teacher workstation. The building information and communications distribution system and other aspects of the building design must comply with the latest edition of MSDE *Maryland Public School Standards for Telecommunications Distribution System*.
- ☐ The architect should refer to the MCPS Facility Guideline Specifications for the main teaching wall layout.
- ☐ The remaining walls should be outfitted with magnetic maker board and a tack strip above.
- ☐ A small 4x4 tack board may be considered near the entrance of each classroom and will be discussed during the quarter scale review.
- ☐ Each classroom must include built-in adjustable shelving under the windows.
- ☐ A small lockable teacher's wardrobe must be provided, as per MCPS Facility Guideline Specifications.
- ☐ This classroom should be equipped with a handicapped accessible sink. Cabinets should be provided above and below the counter area.
- ☐ Each classroom should be equipped with window coverings. DDC will provide the specifications for the window coverings.
- ☐ Electrical and data outlets should be provided in the ceiling for a ceiling mounted LCD projector.
- ☐ Battery operated clocks will be installed. The clock should not be mounted behind the projection screen.

Speech/Language Room

- ☐ This room requires a marker board, tack board, open and closed lockable storage, open shelving, and a lockable teacher wardrobe.
- ☐ Room for a teacher's desk, lockable file cabinet, and table to work with small groups of students is required.
- ☐ The speech/language room should be wired for access to one computer workstation each.
- ☐ The speech room must be located on the first floor and be acoustically treated.
- ☐ The speech room needs a 4’ x 4’ mirror mounted to the wall to supplement verbal skills training.
- ☐ The speech room requires a sink with counter space.

Occupational Therapy/Physical Therapy (OT/PT) Room

☐ Each room must have two marker boards that are mounted two feet off the floor.

☐ A tack board, open and closed lockable storage, open shelving, and a lockable teacher wardrobe are required.

☐ A sink with counter space is required in the OT/PT room.

☐ Room for two teacher's desks, lockable file cabinet, and assorted sized furniture with adjustable legs should be provided.

☐ The OT/PT room should be wired for access to two computer workstations each.

☐ Data and electrical outlets should be located on all walls to allow for multiple uses and flexibility to move equipment around if needed.

☐ The OT/PT room requires a ceiling mounted hook, with a 12'foot diameter clear space for hanging swings and other suspended equipment.

Swing Hardware and Accessories Recommendations

- **Equipment that should be paired**- Base mat, chain for length, height adjuster, rotational component.

- Kit-LINK
- Includes rotational hook: LINK and chain: LINK Height adjuster: LINK
- Mat- LINK

Swings:
- Cocoon: LINK - Autism
- Platform: LINK - OT/PT/PEP

☐ The OT/PT room requires a lockable storage closet with sufficient area to house large gross motor equipment (minimum of 35 square feet) such as therapy balls, scooter boards, walkers, balance beams, ramps, etc.

Testing Room

☐ School and/or central office staff test individual students or small groups of students. Typical testing includes psychological, diagnostic, vision/hearing, gifted, and makeup testing for required standardized tests. This room also will be used to accommodate post-test conferences with teachers and/or parents.

☐ This room should be designed as a secure room for testing materials and should have a counter with lockable cabinets above and below.

☐ This room needs acoustical treatment as well as video, voice, and data outlets.

Support Staff Offices

- ☐ Office space is needed for permanent as well as itinerant support staff (curriculum coordinator, team coordinator, social worker, psychologist, auditory and vision specialists, and psychiatrist).
- ☐ A teacher’s wardrobe should be provided for itinerant staff use.
- ☐ Video, voice, and data outlets should be provided.

Parent Resource Room (For Title 1 Schools)

- [ ] Space for a teacher's desk, computer, and telephone should be provided.
- [ ] Space for a conference table and chairs as well as soft seating should be provided in this room.
- [ ] Space should be provided for bookshelves and other shelving to store a variety of types of materials and supplies.
- [ ] Data and electrical outlet should be provided for an interactive teaching board.
- [ ] Magnetic board should be provided in this room.

Library Media Center

Spatial Needs
Main Learning Environment
Instructional Area
Work and Production Area
General Storage

- ☐ The Library Media Center (LMC) is the information hub of the school.
- ☐ The latest version of the MSDE document, *Facilities Guidelines for Library Media Programs,* may be used as a reference for the design of the LMC.
- ☐ The LMC should be centrally located and easily accessible from the outside to allow the LMC easy access by outside groups during after school hours and in the summer.
- ☐ There should be easy access to the elevator.
- ☐ Toilet rooms should be located nearby the LMC.
- ☐ Sight lines are an important feature in the design of the LMC. Staff should have visual supervision of the entire LMC including the entrance from the LMC circulation desk.
- ☐ Flexible lighting with the ability to darken separate areas of the main resource room without affecting other spaces.
- ☐ If possible, the LMC should not be located below high noise level activities such as music, technology education, cafeteria, or physical education.
- ☐ Multiple charging outlets need to be provided throughout the LMC and can be located in the floor, wall, and counters. Consideration should be given to the location of the circulation desk and seating areas that may require data and or power for the use of computers or staff/student work areas.
- ☐ Ideally, a countertop with outlets above the counter should be provided along one of the walls of the LMC to allow users to plug in portable devices. The counter should be located in an area that can be easily supervised and at a desk top height so that chairs can be interchanged in the library.

Main Learning Environment

This is the main area of the library that includes the stacks, instructional space, and circulation area.

Stacks (the area containing book shelves)

☐ The height of the low moveable bookshelves should accommodate three rows of books and the height should be 42 inches high in order to accommodate picture and nonfiction books.

☐ Must be on wheels to allow for flexibility.

☐ Different materials can be explored based on design and cost factors to include metal and wood shelving.

☐ Soft, comfortable seating should be provided for individual and collaborative student work and power should be provided throughout this area.

☐ Consideration should be given for shelving for special types of collections such as graphic novels, periodicals, and oversized books including picture books. The shelving should be flexible that can convert for different types of collections.

☐ Wall shelving should be maximized in this area, where possible. (height 5 feet when possible)

☐ Consideration should be given to provide opportunities to display and highlight student work and items in the collection.

☐ Lights should be designed to allow for flexible arrangement of shelving in the stacks.

☐ Shelving is to be allocated on the average as follows:

	Linear Feet
Non-Fiction (including biographies)	430
Fiction	285
Picture Books (with no dividers)	75
Magazines (with space for back issues)	12
New Book/Interest Display	10
Media Center Storage (20-24” depth)	As space allows

Circulation Area

- ☐ The architect needs to identify a location for a circulation desk that is large enough to accommodate two computer workstations and a networked printer to access the online catalog system.
- ☐ If space permits, storage cabinets should be provided in the circulation area for miscellaneous activities such as book repairs and holds.
- ☐ The circulation desk furniture package will include the following features:
  - ☐ a storage area for book return carts;
  - ☐ a book return container to catch the books;
  - ☐ supplies drawers;
  - ☐ a writing area unit; and
  - ☐ an area for a laser printer and supplies.
  - ☐ The front height of the circulation desk should have an area that does not exceed 39" in height so that elementary students have access.
  - ☐ There should be two means of egress for the circulation desk.
  - ☐ The work surface for the staff member should meet ADA compliance with optimal ergonomics (keyboard height).
  - ☐ Electric and Ethernet needs to be provided.

Instructional Area

- ☐ Sight lines are an important feature in this area. Staff should have visual supervision of the entire LMC from this area.
- ☐ A teaching wall area designed for an interactive board should be included.
- ☐ This area needs to accommodate read-alouds and other instructional activities.
- ☐ This area should include table and chair seating as well as soft seating so that the combination of seating totals 30. A variety of heights in the instructional area for students including standing and sitting options should be provided.
- ☐ The space should be easy to reconfigure for a variety of uses and groupings with the use of flexible furniture to support whole class, small group, and project based learning activities.

☐ The instructional areas need access to all forms of technology in the school including wireless access.

Work and Production Area

This area was formerly two distinct spaces: the library media specialist office and library media center workroom. The new combined space now supports the library media staff functions and is also used as a multipurpose space to include maker activities for student and school staff use.

☐ The work area should be delineated through the use of a different ceiling height or half wall.

☐ This room requires VCT floor material.

☐ Consideration for a counter for student use is preferable.

☐ Adequate electrical and data outlets are to be designed in consultation with the LM Specialist and central office staff members.

☐ It must contain a sink with hot and cold water, in addition to ample worktops for library media processing, student and teacher use.

☐ Space is needed for two staff work stations. This can be built-in or through furniture.

☐ Two lockable wardrobes need to be provided. See media center specifications available from the MCPS Facility Guideline Specifications.

☐ This space needs to contain open shelving to accommodate materials for student use such as maker space supplies and hands on activities as well as closed lockable cabinets for library media center supplies.

☐ Space should be provided for a networked school printer that is accessible by teachers and students.

☐ Electric and data should be located on all walls to provide flexibility in the use of the space.

☐ The work area includes space for collaborative planning and processing of library media materials.

Library Media Storage

☐ The library media storage room provides for storage of library media materials, equipment, seasonal materials and supplies.

☐ Electric and Ethernet should be provided to accommodate library media technology needs.

- ☐ A variety of shelving should be provided for instructional materials for teacher use such as DVDs, audio book resources, and equipment with some open space to accommodate computer cart storage.
- ☐ Varied depths of shelving should be provided including 6”, 12” and 24” deep.

Physical Education

The gymnasium has two major purposes:

- To provide an indoor facility for the physical education instructional program.
- To provide for student and community recreation during after school hours, weekends, summers, and holidays.

Spatial Needs
Gymnasium (74’x50’)
Physical Education Office
Storage Rooms
Lobby Area
Outdoor Storage

Gymnasium

☐ The location of the gymnasium should be near the play areas, directly accessible from a corridor, and easily accessible from the parking lots.

☐ Buffering the gymnasium with a corridor or related spaces is required to separate gymnasium noise from the rest of the school.

☐ No glass walls should be designed in the gymnasium for safety and security purposes. Clerestory windows can be designed to provide natural light in the gymnasium.

☐ The physical education office should be adjacent to the gymnasium and lobby.

☐ The architect should refer to detailed requirements provided by MCPS Facility Guideline Specifications.

☐ Any windows into the gymnasium should be oriented north and south so that direct east-west sunlight does not impact play in the gymnasium. However, windows should not be placed in the end walls.

☐ The gymnasium should be ADA accessible from within and without (access from inside gym to playfields).

☐ A ceiling clearance of a minimum of 24 feet free of girders, pipes, heating vents, lights and curtain supports is required.

☐ No ledges or sills should be created over 6' in height that would make it difficult to retrieve a ball.

☐ Glazed tile on the walls must cover at least seven feet from the floors.

☐ If the gymnasium is a community sized gymnasium (84’x 75’) then a vinyl-mesh curtain to divide the floor area into two equal size spaces should be provided. It must be the type that can be electrically rolled to the ceiling for storage. If the gymnasium has a divider curtain, a clock with a protective wire covering should be provided on both ends of the room.

- ☐ Adequate lighting in the gymnasium is required. The lighting should be securely mounted and guarded to prevent damage by balls with keylock switches to control the lighting.
- ☐ A minimum number of windows to prevent glare and glass breakage is requested.
- ☐ Acoustical treatment of walls and ceiling is required and must be able to withstand damage by balls.
- ☐ Ventilation equipment must not inhibit use of the space for auditorium purposes.
- ☐ A wood floor should be installed in the gymnasium. Striping for basketball, volleyball, and floor games should be provided. (i.e. hopscotch and four square)
- ☐ Graphics or approved words should be painted on the gymnasium walls. The school may choose from an approved curriculum list of words to paint on the gymnasium walls. The list of words will be provided by MCPS staff.
- ☐ A marker board, 4’x6’, with no ledge is required.
- ☐ Separate heating source or controls to permit use when the remaining part of the building is not occupied is required.
- ☐ Recessed door handles are required.
- ☐ Doorway center posts must be removable to allow for the passage of equipment.
- ☐ A recessed fire alarm box or covered fire alarm box, preferably in a corner of the room needs to be provided.
- ☐ Two call buttons located at opposite sides of the gymnasium are required to contact the main office.
- ☐ A clock with a protective wire covering should be provided on a sidewall of the gymnasium. The fire extinguisher, if mounted in the gymnasium, should be recessed into the wall.
- ☐ Wall safety padding must be mounted under each basketball backstop with 16 feet under end basketball backstops and 12 feet under side basketball backstops with nylon nets.
- ☐ Doors or openings should not be directly behind basketball backstops.
- ☐ Fan-shaped basketball backstop, adjustable from 8 feet to 10 feet, must be mounted four feet from the sidewalls to provide two equal sized side courts. The backstops must be of aluminum composition. Collapsible rims must be provided.
- ☐ A basketball backstop, adjustable from 8 feet to 10 feet, must be mounted on each end wall for full court play. The fan-shaped backstops must be of aluminum composition. Collapsible rims must be provided.

- ☐ A hand crank must be provided for the adjustable basketball backstops if they are not operated electrically.
- ☐ Four climbing ropes (1 knotted, 3 plain) with hoist located 6 feet from the ground and safety cables located away from ceiling lights and basketball backstops should be provided.
- ☐ One 8-foot semi-guyed (wall mounted) horizontal bar with safety chain and floor plates should be provided. The MCPS shade shop will provide safety padding.
- ☐ One pair of volleyball aluminum uprights and one center volleyball aluminum upright (insertion type) must be provided. Heavy-duty net ratchet and removable crank handle should be included.
- ☐ Five solid brass floor plates and floor sleeves need to be installed. Two volleyball nets, 32" in length with end sleeves for wooden dowels should be provided.
- ☐ Two portable game standards are required.
- ☐ Audio controls for a sound system that are easily accessible to the instructor should be provided.
- ☐ A wall-mounted, chin up bar should be provided. The lowest bar height should be approximately 5 feet from the floor.
- ☐ Video, voice, data and electrical outlets on opposite walls of the gymnasium are required.

Physical Education Office

The following items are required in the physical education office:

- ☐ Non-breakable window to the gymnasium, low enough to view students, is required.
- ☐ Non-breakable window to the lobby for supervision, low enough to view students, is required.
- ☐ Toilet and shower facilities are required.
- ☐ Video, voice, data and electrical outlets are required.
- ☐ Window blinds for windows are required.
- ☐ VCT flooring is required.
- ☐ A call button the main office is required.
- ☐ Three full size clothing locker should be provided.
- ☐ Electrical outlets.
- ☐ A tack board should be provided.

- ☐ A wall-mounted clock should be provided.
- ☐ A small closet with shelves should be designed in this office.

Storage Rooms

- ☐ All of the storage rooms require 8-foot doors and 12-foot ceiling heights with a flush threshold.
- ☐ One of the storage rooms needs to accommodate and maneuver a mat mover cart (7' x 3') in and out of the room easily.
- ☐ The large storage room requires 8-foot double doors with no center post and must be able to accommodate a set of parallel bars.
- ☐ The large storage room must contain shelves, 6 feet high and 18 inches deep, mounted on at least two walls. The shelves must be adjustable after installation.
- ☐ The large storage closet must have a length that will accommodate a 12' long balance beam.
- ☐ Both of the small storage closets must contain shelves, 6 feet high 18 inches deep, mounted on the two side and back walls. The shelves must be adjustable after installation.
- ☐ One of the small storage rooms will be used for community use (ICB) and should have straps to store the volleyball standards along one wall (about 10' long).

Lobby Area

- ☐ Separate toilet rooms for boys and girls should be located in the lobby.
- ☐ An electric water cooler with bottle filling station and filter should be located in the lobby area.
- ☐ Six feet of tack board should be installed in the lobby area.
- ☐ The window between the lobby and physical education office must be low enough to view people in the lobby.
- ☐ A set of doors to separate the gymnasium, lobby area, and restrooms from the rest of the school during after-hours is required.

Multipurpose Room and Platform

Spatial Needs
Multipurpose Room
Platform
Chair Storage
Table Storage
Before/After Care Kitchenette
Before/After Care Storage

Multipurpose Room

- ☐ The multipurpose room should have a ceiling height of 12–14 feet.
- ☐ A building service utility closet should be provided near the entrance to the multipurpose room for convenient lunch cleanups.
- ☐ Table storage and chair storage must be located adjacent to the multipurpose room.
- ☐ Exits from the multipurpose room must be sufficient to allow maximum seating.
- ☐ The doors from the main corridor into the multipurpose room should be on hold opens.
- ☐ Toilet rooms and an electric water cooler with bottle filling station and filter should be near the multipurpose room to allow for public use.
- ☐ Audiences need to be able to hear and see presentations from all locations in the room.
- ☐ Ventilation equipment noise must not inhibit use of the space for auditorium purposes.
- ☐ Acoustical treatment is needed.
- ☐ Proper lighting and sound amplification are required.
- ☐ Each side of the risers at the multipurpose room floor level should be equipped with video, voice, data and electrical outlets.
- ☐ Lighting, windows, fire alarm box, clock, and ceiling must be protected to prevent damage by balls.
- ☐ Outdoor play areas should be accessible from the multipurpose room. Children should not have to cross driveways or parking lots to access the play areas.
- ☐ An audio loop system should be provided for hearing impaired students; guidelines are available through the Division of Desisgn and Construction .
- ☐ An independent sound system should be provided in the multipurpose room.

☐ A call button to the main office should be provided.

Platform

☐ A minimum of 450 square feet of useable space must be provided for the performance platform.

☐ The platform should have a proscenium opening 24 feet wide. The depth is to be 15 feet deep. The platform floor is to be three risers above the multipurpose room floor. A full set of platform curtains is to be provided. An 8'x10' motorized projection screen is to be provided. Platform steps must NOT be carpeted.

☐ The platform must be accessible to the physically handicapped.

☐ Each side of the platform should be equipped with video, voice, data and electrical outlets.

☐ Access should be provided to the platform from both sides.

Chair and Table Storage

☐ Storage rooms are required for the storing the tables in the multipurpose room and folding chairs.

Before/After Care Kitchenette

☐ A sink (34”), refrigerator, counter space, and base and wall cabinets should be provided in this area.

☐ A secured overhead door is required for this space.

Food Services

- ☐ The kitchen is operated as a "finishing kitchen" and should include an area for dry storage, a manager's workstation, toilet facilities, preparation and serving area, and a receiving area for daily deliveries.
- ☐ A sheltered dock is preferred and should be separate from other school receiving.
- ☐ Delivery flow path must be clear of preparation area.
- ☐ The trash room should be separate from the rest of the building i.e. no common walls.
- ☐ The trash room should not be accessed from the kitchen.
- ☐ Air conditioning must be available at all times in elementary kitchens, storage, and office.
- ☐ Code requirements for lighting, surfaces, and equipment must be met. These requirements are included in the MCPS Facility Guideline Specifications.
- ☐ Windows must have screens.
- ☐ Receiving door should be 48" wide and must be self-closing with peephole and doorbell to manager's office.
- ☐ An easy to mop floor such as, slip resistant quarry tile floor or polyurethane cement flooring system is required. If quarry tile is used then the color of grout should be the same or darker than the color of the floor.
- ☐ There should be direct access to both the hallway and the multipurpose room to facilitate one-way circulation through the serving line.
- ☐ A minimum 9' ceiling height is recommended.
- ☐ A building service closet with floor type mop basin shall be located outside the kitchen but readily accessible to the kitchen.
- ☐ A dedicated circuit is required for the cash register with under the floor conduit for connection to the computer in the manager's office.

Serving Area

- ☐ A 26 ft. long serving line with 3-ft. clearance at each end should be provided.
- ☐ The color selection will be approved by Food Services.
- ☐ A single door refrigerator and microwave oven on a cart adjacent to the service area is needed.

- ☐ A wall clock and tack board should be located on a wall so it is visible from the serving line wall.

Walk-in Cooler/Freezer

- ☐ A 7' 9" x 8' 8 1/2" cooler is required.
- ☐ A 7' 9" x 10’ 8 1/2" freezer with a height of 8' 6" is required.
- ☐ A mobile polymer shelving and dunnage is required.
- ☐ A roof top compressor is required.

Dry Storage

- ☐ The recommended dimension for the dry storage area is 12’ x 16’.
- ☐ A mobile polymer shelving and dunnage is required.
- ☐ Adequate ceiling height for top shelf storage should be considered.
- ☐ This space should be totally secure and free of roof access ladders or electrical panels.
- ☐ Locking cabinets for chemical storage should be provided.

Manager‘s Office

- ☐ Visibility to delivery and serving area is required.
- ☐ The office should be located away or protected from outside door draft.
- ☐ Desk (NIC), file (NIC), telephone, tack board, and LAN access are required.

Toilet Room

- ☐ A hand sink with soap and towel dispenser, sanitary napkin disposal, and three full-height lockers are required.

Preparation Area

- ☐ A roll-in double convection oven is required.
- ☐ An oven cart and dolly (2 each) are required.
- ☐ A half size range is required.

☐ A heat removal exhaust hood is required.

☐ Work tables, one 6 ft. and the other 8 ft. with 2 drawers each, under the table are needed.

☐ Arlington wire baskets (500 each) and dollies (10 each) are required.

☐ Hand sink with pedals and soap and towel dispensers that meet the code requirements are needed.

☐ A three compartment sink, 24” x 24” x 14”, with 24 inch drainboards, is required. Disposal in drain board with pre-rinse spray is required.

☐ A 6-foot louvered shelf above with hooks is required.

☐ A mobile warmer to accommodate Arlington baskets is needed.

☐ Two utility carts are required.

Administration suite

Spatial Needs
General Office
Workroom
Command Center
Principal's Office
Assistant Principal's Office
Conference Room
Counselor's Office
Storage Room
Records Room

☐ The administration suite must be located with good access from the main entrance of the school and visual oversight of the main entrance and bus drop-off area.

☐ The suite must be a natural first stop for visitors to the school and must, therefore, have direct corridor access. A security vestibule must be designed so that all visitors must enter the general office to check in before entering the school.

☐ Spaces need to be arranged for student and visitor flow and for efficient use by office staff.

☐ The general office is to be treated as the center of the administration suite with direct access to the principal's office, the workroom, and the health suite.

☐ A coat closet is to be provided for office staff and visitors.

☐ Sufficient electrical outlets are to be provided (where feasible, quadruplex outlets may be utilized) as well video, voice, data and electrical outlets for the general office, principal's, and assistant principal's offices.

☐ A glass display case should be located in the vestibule of the Administration suite entrance.

☐ The administration suite should be designed with separate toilet rooms. If the school chooses, one of these toilet rooms may be located in the principal's office.

☐ The administrative secretary should have access to a private area during the day to work on fiscal duties.

General Office

☐ A counter/or furniture should be provided near the entrance to greet and separate visitors from staff and to provide a place to write.

☐ Space for two to three staff persons is required behind the counter/furniture.

- ☐ The general office should be equipped with a staff bulletin board.

Workroom

- ☐ The location of mailboxes should not create congestion by impeding the smooth flow of traffic in the general office and hallways. Staff mailboxes are to be readily accessible but not visible from the main entrance and are to contain 80 boxes at least 5.5 inches tall by 12 inches wide plus five additional boxes that are somewhat larger.
- ☐ Cabinetry appropriate for storing a variety of office and school supplies should be designed along one wall of the workroom.
- ☐ A portion of countertop is to be more than 30 inch wide to accommodate a large paper cutter.
- ☐ Space adequate for a large copying machine with necessary electric service and ventilation is required.
- ☐ A sink (34”) is needed in the workroom.
- ☐ There should be direct access to a corridor from the workroom.
- ☐ The workroom should be treated acoustically to keep machine and work noises at low levels.

Command Center

- ☐ An interior room in the school needs to be designated as the command center for shelter in place/lock down emergencies. In many schools, the workroom in the administration suite may serve this purpose. The room cannot be on an outside wall.
- ☐ The room designated as the command center must have all data and communication equipment including the public address (PA) system.
- ☐ The PA console should be located in the room that is designated as the command center.
- ☐ Window coverings such as mini blinds or roller shades must be provided for all windows and doors to the command center.
- ☐ In secondary schools, the security camera monitors should be located in this area.
- ☐ The space designated as the Command Center must be large enough to accommodate up to six staff persons.
- ☐ Storage space is needed for the shelter in place/lock down emergency kit.

Principal's Office

- ☐ This office requires an outside window, a public entrance connected to the main office, and a private entrance.
- ☐ These areas are to relate effectively with each other as well as to the general office.
- ☐ Each office should be planned for an l-shaped desk, computer, phone, file cabinets, and a small table for four to six chairs for small group meetings.
- ☐ This office requires a private toilet room.

Assistant Principal's Office

- ☐ This office should be carpeted.
- ☐ This office should be equipped with a tack board and two-shelf adjustable bookcases under the windows. Each shelf must be able to hold a 12 inch notebook upright
- ☐ This office should have good visible access to the main entrance and bus drop-off.

Conference Room

- ☐ The conference room should be carpeted.
- ☐ The conference room requires a magnetic marker board, a tack board, and one bookcase.
- ☐ The conference room should be equipped with a video, voice, data and electrical outlets and outlets to accommodate an interactive teaching board.

Counselor's Office

- ☐ The counselor's office should be easily accessible from the classrooms and near, but not a part of, the administration suite and should have a window.
- ☐ This office needs a marker board, tackboard, telephone and computer.

Storage and Records Rooms

- ☐ Two lockable rooms are needed for storage of office supplies and student records.
- ☐ The records room needs space for lockable file cabinets.

2nd Floor Workroom

- ☐ This room requires appropriate electrical wiring and ventilation to house a copier for staff use.
- ☐ This room requires a work counter and cabinets under and over the counter for storing supplies.

Staff Development Area

Spatial Needs
Staff Development Office
Reading Specialist Office
Training/Conference Room

Staff Development Office

- ☐ The staff development area should be located near the classrooms.
- ☐ The office should include one workstation.
- ☐ This office needs a marker board, tack board, closet, and video, voice, and data outlets.

Reading Specialist Office

- ☐ The staff development area should be located near the classrooms.
- ☐ The office should include one workstation.
- ☐ This office needs a marker board, tack board, closet, and video, voice, and data outlets.

Training/Conference Room

- ☐ This room will be used for staff training needs.
- ☐ This room should include ample shelving for training materials.
- ☐ The room should be able to comfortably accommodate up to 12 participants seated around a conference table.
- ☐ A marker board and tack board should be installed.
- ☐ Data and electrical outlets should be provided to accommodate an interactive teaching board.

Health Services Suite

Spatial Needs
Waiting Area
Treatment/Medication Area
Office/Health Assessment Room
Health Assessment/Isolation Room
Rest Area
Toilet Room
Storage Room

☐ The Health Services Suite should be in complete compliance with COMAR 13A.05.05.10A.

☐ The health suite must meet accessibility requirements of the ADA, and at a minimum, include spaces for waiting, examination and treatment, storage, resting, a separate room for private consultation and for use as the school health services professional's office, a toilet room, and lockable cabinets for storing health records and medications.

☐ A designated school health services professional from the Montgomery County Department of Health and Human Services (DHHS) must be involved in the planning of the health services suite.

☐ The architect should refer to MSDE document, *School Health Services,* June 2002 for specific utility information.

☐ The suite should be designed to provide easy visual supervision of all the spaces by the health services professional. The suite should be laid out so that an additional workstation for a health professional can be positioned near the treatment and waiting areas.

☐ In addition to access to the general office, the health services suite also must have a window into the general office so that office staff may monitor the room when heath staff is unavailable.

☐ The health room also must have a door to the corridor.

☐ Ventilation is important throughout the health suite.

☐ The countertops should be seamless to aid in maintaining sanitary conditions.

☐ The floor finish should be an easily cleaned non-absorbent material. Carpet should not be used in any areas of the health suite.

☐ A non-porous ceiling material should be used. Vinyl-coated ceiling tile or painted drywall is an acceptable choice.

☐ If any of the areas are enclosed then glazed walls areas should be provided.

- ☐ The health suite requires wall and base cabinets, lockable file cabinets, for storing health records. A portion of these cabinets must be lockable to store medications, medical supplies, and equipment.

Waiting Area

- ☐ The waiting area should have space for four to eight chairs.
- ☐ A small tack board should be provided in the waiting area to display health care and other information of importance to students and staff.

Treatment/Medication Area

- ☐ This area should be adjacent to the waiting area to facilitate the efficient flow of students.
- ☐ This area should have a kitchen type sink (34") with cabinets above and below (including a locked medicine cabinet), a 34-inch high countertop, and a small residential style refrigerator/freezer to store medical supplies and foods.
- ☐ A minimum of 12 linear feet of wall and base cabinets should be provided.
- ☐ The freezer should have an icemaker.
- ☐ The treatment area also requires a computer.

Office/Health Assessment Room

- ☐ The room requires one computer, fax machine, and electronic connection and physical proximity to a copy machine.
- ☐ The spaces used for consultation and examinations must be enclosed with sufficient acoustical isolation to ensure complete privacy and confidentiality.
- ☐ A small sink (34"), with cup, towel, and soap dispensers should be provided.

Health Assessment/Isolation Room

- ☐ This room needs to have access and have a door to the corridor.
- ☐ The spaces used for consultation and examinations must be enclosed with sufficient acoustical isolation to ensure complete privacy and confidentiality.
- ☐ A small sink (34"), with cup, towel, and soap dispensers should be provided.

- ☐ Space should allow for a small desk, secretarial chair, three lateral file cabinets with four drawers and a recovery cot.
- ☐ This room will require a telephone and a computer..
- ☐ In the rest area and Isolation Room, supplementary power ventilation capable of 20 changes per hour should be provided, with control by means of a separate switch within the health suite.
- ☐ A window is needed in this room to provide supervision from the treatment area and office. The design of the window also needs to ensure that only staff can see into the room.

Rest Area

- ☐ This area should not be a fully contained room but rather an area that can provide privacy for each cot with a draw curtain on a ceiling track.
- ☐ The rest area needs space four cots with individual light switches for wall sconces, electrical outlets 16” from the finished floor, and bedside cabinets for each rest area.
- ☐ This area should not be a fully contained room but rather an area that can provide privacy for each cot with a draw curtain on a ceiling track.
- ☐ The Isolation Room (see above) should be located adjacent to the rest area,
- ☐ In the rest area and Isolation Room, supplementary power ventilation capable of 20 changes per hour should be provided, with control by means of a separate switch within the health suite.

Toilet Room

- ☐ One ADA toilet should be provided.
- ☐ The toilet room should be accessed without having to go through another functional space in the health suite such as a rest area.
- ☐ Ideally, students should be able to enter the health suite solely to use the toilet room without disrupting other activities.

Storage Room

- ☐ The storage area is to have space sufficient for a four drawer locked file cabinet, a wardrobe for coats, and space for storing large items such as wheelchairs.

Staff Lounge

- ☐ The staff lounge is a place for staff members to relax, study, plan, and think together.
- ☐ Two toilet rooms are required just outside of the staff lounge.
- ☐ The staff lounge should contain a compact built-in kitchen with six linear feet of counter space for a microwave and sink (34”) and a space for a refrigerator (NIC).
- ☐ A clock should be provided.
- ☐ Ventilation must be provided. An operable window in the staff room is preferred.
- ☐ An area should be designated for Video, voice, data and electrical outlets.

Privacy Room

- ☐ A small, enclosed room with countertop and space for one chair is needed.
- ☐ An electrical outlet should be provided above and below the counter and the counter should be tall enough to accommodate a small refrigerator.
- ☐ A small sink is needed for hand washing and washing of personal items.
- ☐ A mirror should be provided above the counter.
- ☐ This space needs to be accessible to staff with disabilities.

Building Service Facilities

Spatial needs
Building Service Office
Locker/Shower area
Compactor/Trash Room
General Storage & Receiving Area
General Storage
Building Service Outdoor Storage
Building Service Closets

Building Service Office

☐ The entire building services area should be located adjacent to the general receiving area.

☐ The office should be designed as a general office that can accommodate two staff members with two desks and appropriate wiring for computers, phones, etc.

☐ If possible, the office should have a window or a sightline to the outside to monitor weather conditions.

Locker/Shower Area

☐ A locker area must be located near the receiving area.

☐ Six full-size lockers should be provided in the locker area.

☐ The locker area should be designed with an enclosed toilet room and shower room for building service staff use.

☐ An ENERGY STAR stackable washer and dryer are required in this area.

Compactor/Can Wash/Trash Room

☐ This room needs to be completely separate from the kitchen spaces with no common walls.

☐ Trash trucks must have access to this room.

☐ The room should be heated and have adequate interior lighting, floor drainage, and easily cleanable surfaces.

☐ Hot and cold water should be available for flushing and cleaning.

☐ The room should be designed to be pest free and well ventilated.

- ☐ Floors should be sloped so that wash down stays within the room and goes down the drain.
- ☐ The compactors need to be installed with enough clearance away from the wall to permit staff to access the equipment from all sides.
- ☐ A roll-up door for trash transfer to trucks, steam cleaning equipment, and trash collection containers are needed.
- ☐ The room should be designed with a ramp to allow trashcans to be rolled to the dock.

General Storage and Receiving Area

- ☐ The receiving area should be enclosed, floor to ceiling, with a chain link fence.
- ☐ Flexible shelving is required but should not occupy more than one third of the area.
- ☐ This area must be secured.
- ☐ Good lighting and easy access to materials being stored are required.
- ☐ Electrical outlets, upgraded lighting and ventilation must be provided in this area.

General Storage

- ☐ Flexible shelving to accommodate books, teaching aids, large size (24" x 36") paper, and other instructional supplies is required.
- ☐ Good lighting and easy access to materials being stored are required.
- ☐ Electrical outlets, upgraded lighting and ventilation must be provided in all large storage rooms for future flexibility.

Building Service Outdoor Storage Room

- ☐ Outdoor storage is to be near the service area and is to be suitable for heavy mowing, snow removal, and other outdoor equipment.
- ☐ The dimensions of the outdoor storage area must be able to accommodate two tractors side by side (one tractor is approximately 9’ long by 7.5’ wide and a second smaller tractor) and other equipment.
- ☐ A rolling garage style door and a regular door must be provided.
- ☐ A ramped and paved driveway is required for the tractor so that it can access the sidewalk and driveways of the school during snow removal.

- ☐ Electrical service and lighting inside must be provided. Access to the light switches must be available at both entrances.
- ☐ Proper ventilation for storage of gasoline is required.

Building Service Closets

- ☐ At a minimum, there should be a building service closet for each 19,000 gross square of the facility. In addition, there should be a building service closet on each floor and each wing of the facility and near the gymnasium.
- ☐ The closets should be a minimum of 25 sq. ft.
- ☐ The building service closet must accommodate a minimum of one utility cart.
- ☐ The closet requires shelving for cleaning supplies and a mop/broom holder is required.
- ☐ The closet requires a floor mop sink with hot and cold running water and a floor drain.
- ☐ Where feasible, closet doors should swing outward in order to maximize the storage area and provide easier access to items within the closets.

Building Support Spaces

Spatial needs
Book Storage
PTA Storage
Emergency Command Center
Telecommunications Rooms

Book Storage

☐ This room should be located near the standard classrooms.

☐ Metal shelving that is 12’ deep should be provided in this room.

PTA Storage

☐ This room should be located near the multipurpose room.

☐ Metal shelving should provided along one side of the room.

Telecommunication Equipment Closet

☐ These rooms should have corridor access and be centrally located in the school.

☐ Specifications for this space are available from the MCPS Facility Guideline Specifications.

Site Requirements

- ☐ The architect should consider the architecture of the neighborhood in designing the building
- ☐ The site should be designed to provide a clear view of all play areas and to facilitate supervision from one location.
- ☐ Protective fencing may need to be provided near heavily wooded areas, busy streets, steep hills, parking lots and turnaround areas.
- ☐ Metal drains/grates should not be located in the playing fields, paved play areas and mulched playground equipment areas.
- ☐ Paved areas and fields must be as level as possible. Water should not collect on paved areas or in mulched areas. The architect should consider the architecture of the neighborhood in designing the building.
- ☐ The design should retain as many trees as possible in order to buffer the school and the playing fields.
- ☐ Pedestrian access must be provided from the surrounding neighborhoods.
- ☐ An unimproved area on-site should be designated to serve as an environmental study area in the future. The architects may refer to the following two MSDE design guidelines: *Conserving and Enhancing the Natural Environment on New and Existing School Sites,* 1999 and *A Practical Guide Planning, Constructing, and Using School Courtyards,* 2012. The documents are available at the following website: www.marylandpublicschools.org/MSDE/newsroom/publications
- ☐ A covered area for students in the bus loading area should be provided.
- ☐ Space for buses to load at one time is needed. The number of buses will be reviewed during the design phase in consultation with the Department of Transportation.
- ☐ Bike racks should be provided near the building.
- ☐ Playground equipment areas should not be located at the bottom of hills unless a provision is made to channel water away from the equipment areas.
- ☐ Accessible parking spaces should be located near the main entrance, the before/after Care entrance, and the playing fields.

Driveway and Service Drive

- ☐ The architect/engineer should refer to the MCPS Facility Guideline Specifications when designing the driveway, bus loop, service drives, etc.
- ☐ Bus traffic should be separated from car traffic at all times, when possible. Bus loading zones should be able to accommodate the entire student body.
- ☐ A student drop off area should be provided and must be separate from the bus loop area.
- ☐ All driveways must be arranged so that children do not cross them to get to the play areas.
- ☐ Care for safety of students must be exercised in developing the driveways including use of safety rails in the bus loading area.
- ☐ Pedestrian access to the school facilities should be designed to make the best use of community right-of-ways and avoid crossing of loading zone areas.
- ☐ The site must comply with the most current ADA or COMAR regulations, whichever is most stringent.
- ☐ Site access must be provided to comply with fire protection and storm water management.
- ☐ Driveway aprons are to be perpendicular to the centerline of the street; and if there is an intersecting street on the opposite side from the proposed driveways, the driveway apron should line up with the intersecting street.
- ☐ Driveways should be located so that vehicle headlights do not project into adjacent homes.
- ☐ A service drive is required to service the kitchen, boiler room, and general delivery area. The architect should refer to the MCPS Facilities Guide.
- ☐ Site access must be provided to comply with fire protection and storm water management regulations.

Parking

- ☐ Ideally, a minimum of 80 parking spaces should be designed initially for a school with regular staffing allocations, with future expansion possible. At schools with class-size reduction, 100 parking spaces should be provided.
- ☐ The parking area should be designed to maximize safety and minimize speed.
- ☐ Adequate lighting should be provided.
- ☐ Parking area should have two exits.
- ☐ Guardrails or bollards are to be installed to protect fields and play areas.

Landscaping

- ☐ Planting should include screen planting and other planting needed for erosion control.
- ☐ Existing plant stock, if on site, is to be evaluated for reuse and protected accordingly.
- ☐ Landscaping to support energy conservation and to relate the building to the site with aesthetic appeal must be included.
- ☐ Consideration should be given to safety and security when selecting plant materials.
- ☐ Provision for outdoor watering must be included.
- ☐ The landscaping plan should include areas for outdoors environmental education programs.

Physical Education Site Requirements

The items described below are for a school that meets the minimum useable site size of 7.5 acres that is capable of fitting the instructional program, including site requirements. At schools with smaller sites, the architect is to work with MCPS staff, including the Physical Education Curriculum Coordinator, Safety Director, and school staff to determine layout of the play areas. The outdoor physical educational instructional space should not be compromised for playground equipment.

Softball Fields

- ☐ Two softball fields should be provided with the following design requirements:
- ☐ 250' radius, with a soccer field superimposed should be provided if possible. See below for the soccer field dimensions.
- ☐ The site size will determine the number and dimension of the softball fields.
- ☐ Softball fields should have metal benches protected by fencing for each team's use.
- ☐ The fencing and benches should not interfere with soccer field usage.
- ☐ The softball backstops (2) shall be in diagonal corners of the field or in corners on the same side. See the diagram in the MCPS Facilities Guideline Specifications.
- ☐ Softball infields are not skinned for elementary schools. However, one field may be skinned if it does not significantly impact the soccer playing area.

Soccer

- ☐ The site size will determine the size of the soccer fields. The elementary school size soccer field is 150'x240' however the minimum size field should be 105' x 180'.
- ☐ No permanent goals or temporary goals should be installed on the soccer fields.

Paved Play Areas

- ☐ Two paved areas, 80' x 100' should be provided if the site permits.
- ☐ If located adjacent to one another, a grassy strip of at least 20' should be between the two paved areas.
- ☐ One area should have four basketball goals with appropriate striping (see diagram in the MCPS Facility Guideline Specification).

☐ A second area, designated for primary use, shall be striped according to drawings provided in the MCPS Facility Guideline Specification. On small sites, this pave area should be fenced for use by Grade Kindergarten students.

Playground Equipment Areas (mulched areas)

☐ One or two areas shall be provided near the playing fields and large paved play area for playground equipment. Each area should be approximately 40’x40’. The size and shape of the play area will be developed during the design process in consultation with MCPS staff.

☐ The area shall be level, bare ground, unseeded, and no sod. MCPS will provide equipment dimensions for these areas.

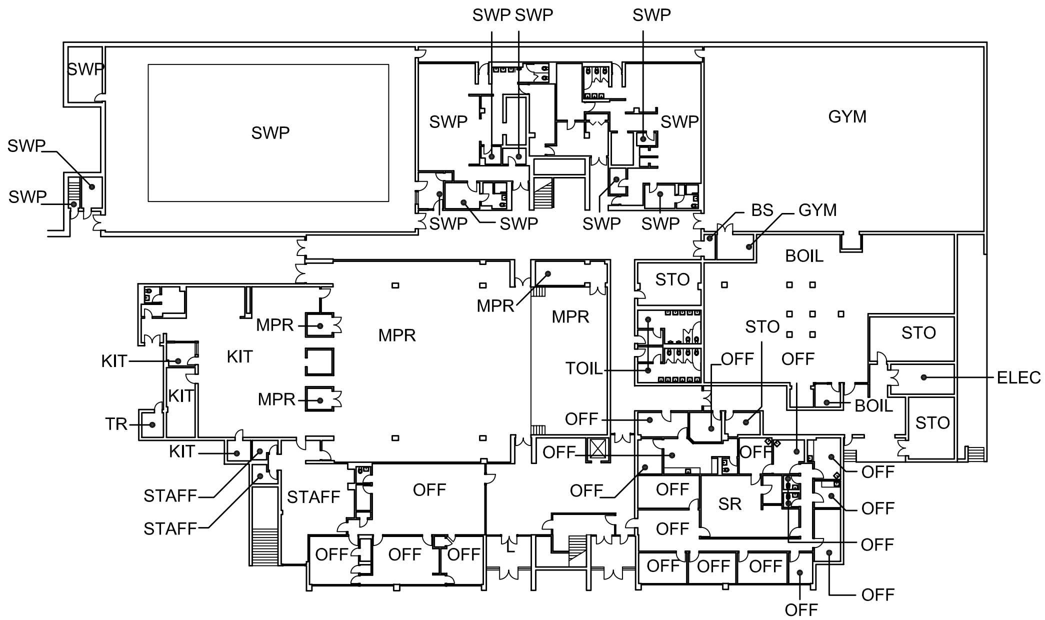
☐ An underground drainage system must be provided.

☐ The loose-fill surfacing material (engineered wood fiber) must meet ADA requirements. A border must be provided to contain the filler. The surfacing materials must meet or exceed safety specifications for shock absorbing qualities as outlined by US CPSC.

Additional Program Requirements

☐ If there is major site work on this project, the design team should review how the arrival and drop-off of disabled students are accommodated to meet current accessibility requirements.

Appendix C - Existing Conditions Survey and Code Analysis



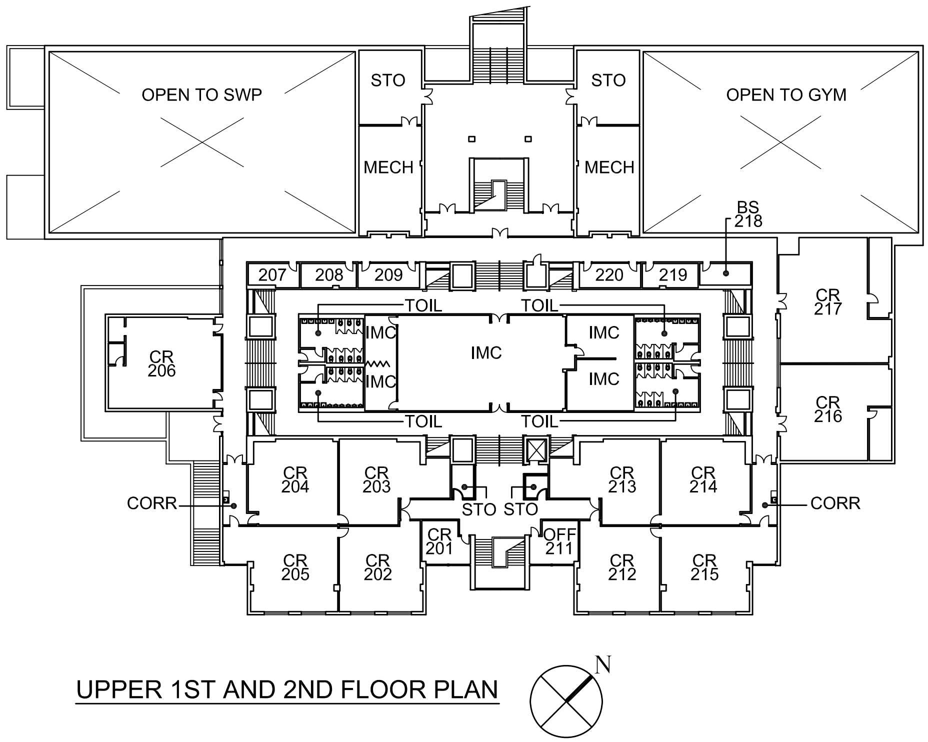
MAIN FLOOR PLAN

N

0' 10' 20' 40'

SCALE = 1:750

PINEY BRANCH ELEMENTARY SCHOOL

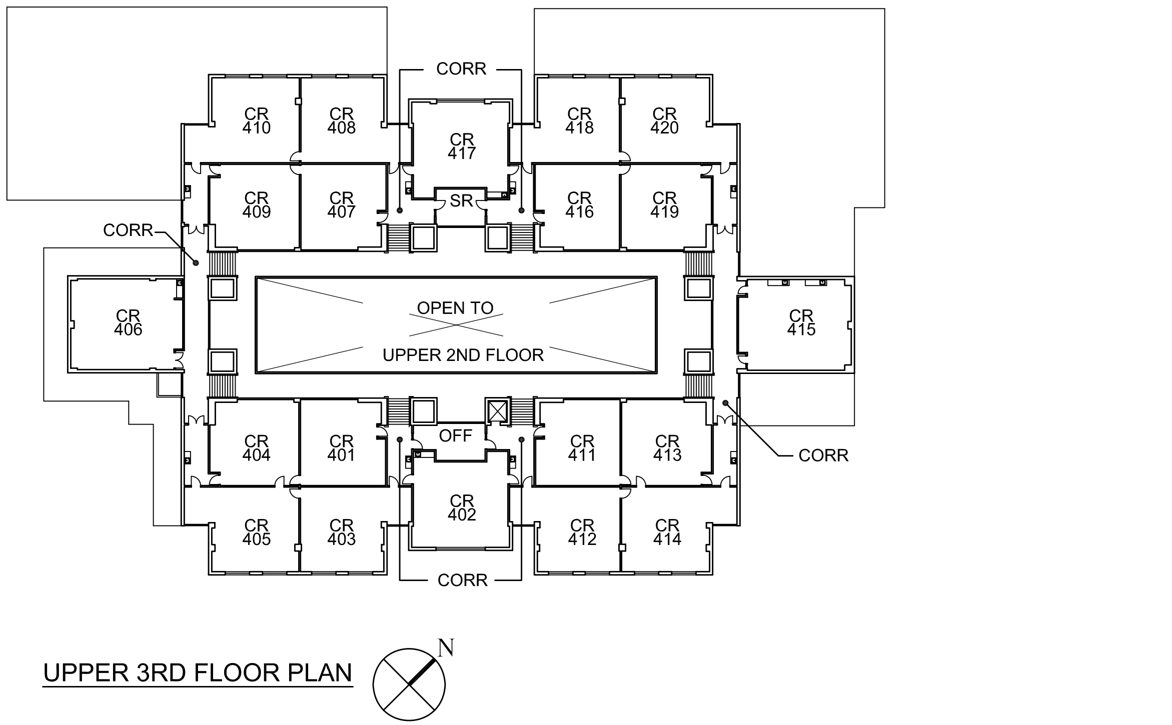


UPPER 1ST AND 2ND FLOOR PLAN

0' 10' 20' 40'

SCALE = 1:750

PINEY BRANCH ELEMENTARY SCHOOL



UPPER 3RD FLOOR PLAN

PINEY BRANCH ELEMENTARY SCHOOL

Montgomery County Public Schools

2018 School Facilities Assessment

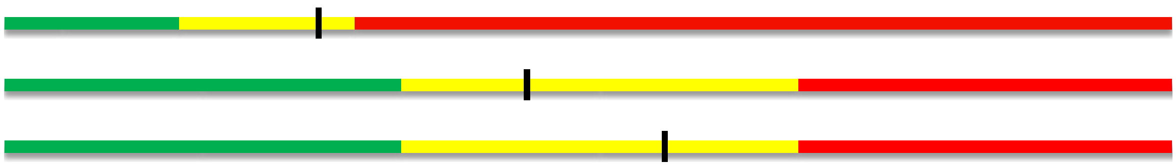
School Number	**749**
School Name	**Piney Branch**
School Type	**Elementary School**
Year Built*	**1973**
Year of Last Renovation*	**Unknown**
GSF*	**99,706**

Building Level - Key Facility Indicators

Infrastructure (FCI)

Building Quality

Indoor Environment



Infrastructure - Facility Condition

	A10	Foundations		C20	Stairs		D50	Electrical
n/a	A20	Basement		C30	Interior Finishes		E10	Equipment
	B10	Superstructure		D10	Conveying Systems		E20	Furnishings
	B20	Exterior Enclosure		D20	Plumbing		F10	Special Construction
	B30	Roofing		D30	HVAC			
	C10	Interior Construction		D40	Fire Protection			

Building Characteristics

Building Quality

- Classroom Shape*
- IMC Size*
- Cafeteria Size*
- Corridor*

Indoor Environment

- Temperature Control
- Humidity Control
- Natural Light
- Acoustic Features
- Building-Level Power Delivery

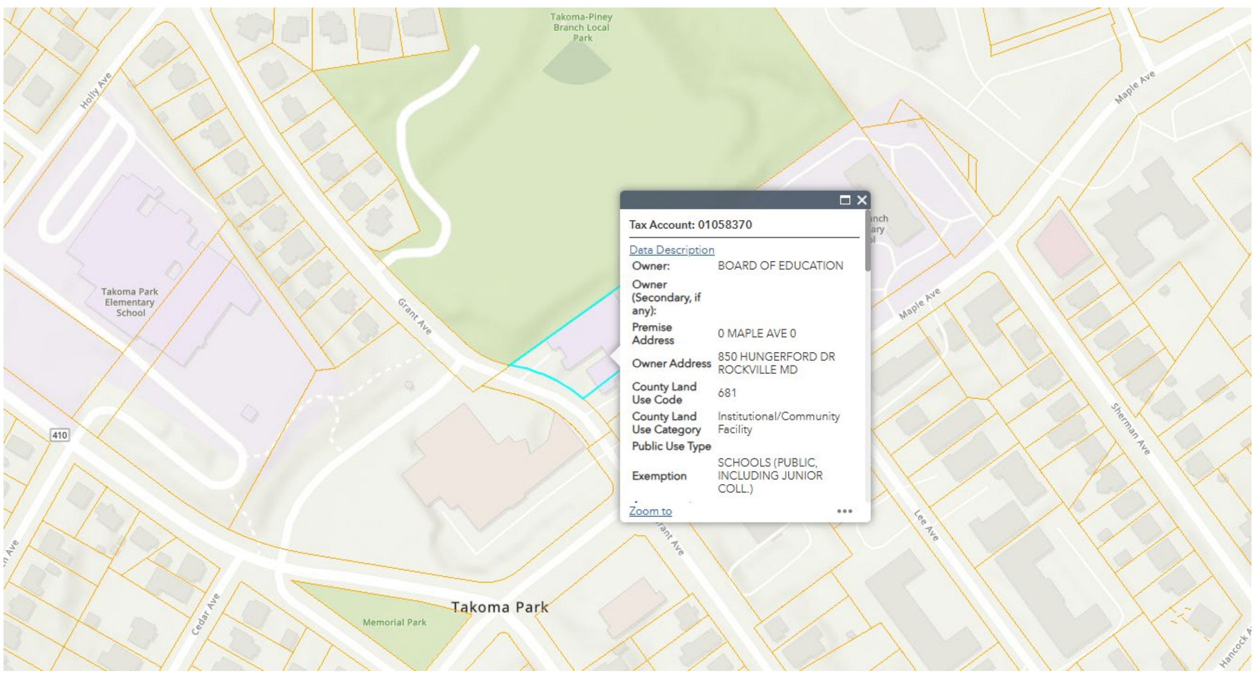
*indicates that underlying data was provided by MCPS not collected by FEA.	
Information Sources:	(References)

Existing Conditions:

General Description:

The existing Piney Branch Elementary School is located at 7510 Maple Ave in Takoma Park, MD. The site is bordered on the southeast by Maple Ave, the northwest by Takoma-Piney Branch Local Park, the southwest by Grant Ave. and the northeast by The Deauville Apartment complex. The property is made up of an assemblage of parcels and is located on tax map JN42. The property is 86,203 sf (1.9 ac). The property is zoned CRT-2.5 which is a commercial residential town zone.

The site is currently an active elementary school and includes the school building, bus and parent drop-off and parking. The adjacent park provides use of their playground, hard surface play space, and grass play fields.



Site Circulation and Parking:

The site currently has five curb cuts: four on Grant Avenue and one on Maple Avenue. The most northwesterly curb cut on Grant Avenue provides access to a small parking area at the rear of the building. The adjacent curb cuts provides access to the loading dock area and another small parking lot. The last curb cut on Grant Avenue, which is the southernmost, serves as the exit only for the bus and parent drop-off loop. The only curb cut on Maple Avenue is the entrance only for the bus loop, parent drop-off, and additional staff parking. Currently both buses and parents enter, drop-off, and exit in the same locations.

The drop-off loop experiences significant congestion during arrival and dismissal times due to having only one exit point and mixing of buses, parents, and staff. This congestion is exacerbated by the curb cut's proximity to the intersection with Grant Avenue and by traffic access adjacent municipal uses. The main parking lot has a total of 23 spaces, including 2 designated ADA parking spaces.

ADA (Americans with Disabilities Act) compliance on the school property is limited. Accessible routes, parking, and entrances do not fully meet current standards, which may pose challenges for individuals with disabilities and will require further evaluation and improvement.

Zoning:

The property is zone CRT-2.5 C-2.5 R-2.5 H-150. Educational uses are allowed in commercial-residential zones. Below are the requirements of the zone:

Lot coverage:	FAR of 2.5 for either residential, commercial or combined (Floor to Area Ratio)
Open Space Required	10%
Building Setback – Front	0'
Building Setback – Side:	0'

Building Setback – Rear: 0’

Building Height: 150’ max

MCPS is allowed leeway in several zoning categories if the building is unable to comply with the zoning requirements. Parking for MCPS projects is based on MCPS experience. It is anticipated that all staff members will be required to park on site and have space for visitor spaces during the day. Due to the limited property size, it is likely that offsite parking will be needed for some staff members.

Property Topography:

In general, the property drains from the northwest towards the southeast. The drainage for the site drains to an unnamed tributary to Sligo Creek and is in MDE watershed #02140205 which is listed as use I water. Class I waters are designated as water contact sports, fishing, agricultural water supply and industrial water supply.

Soils

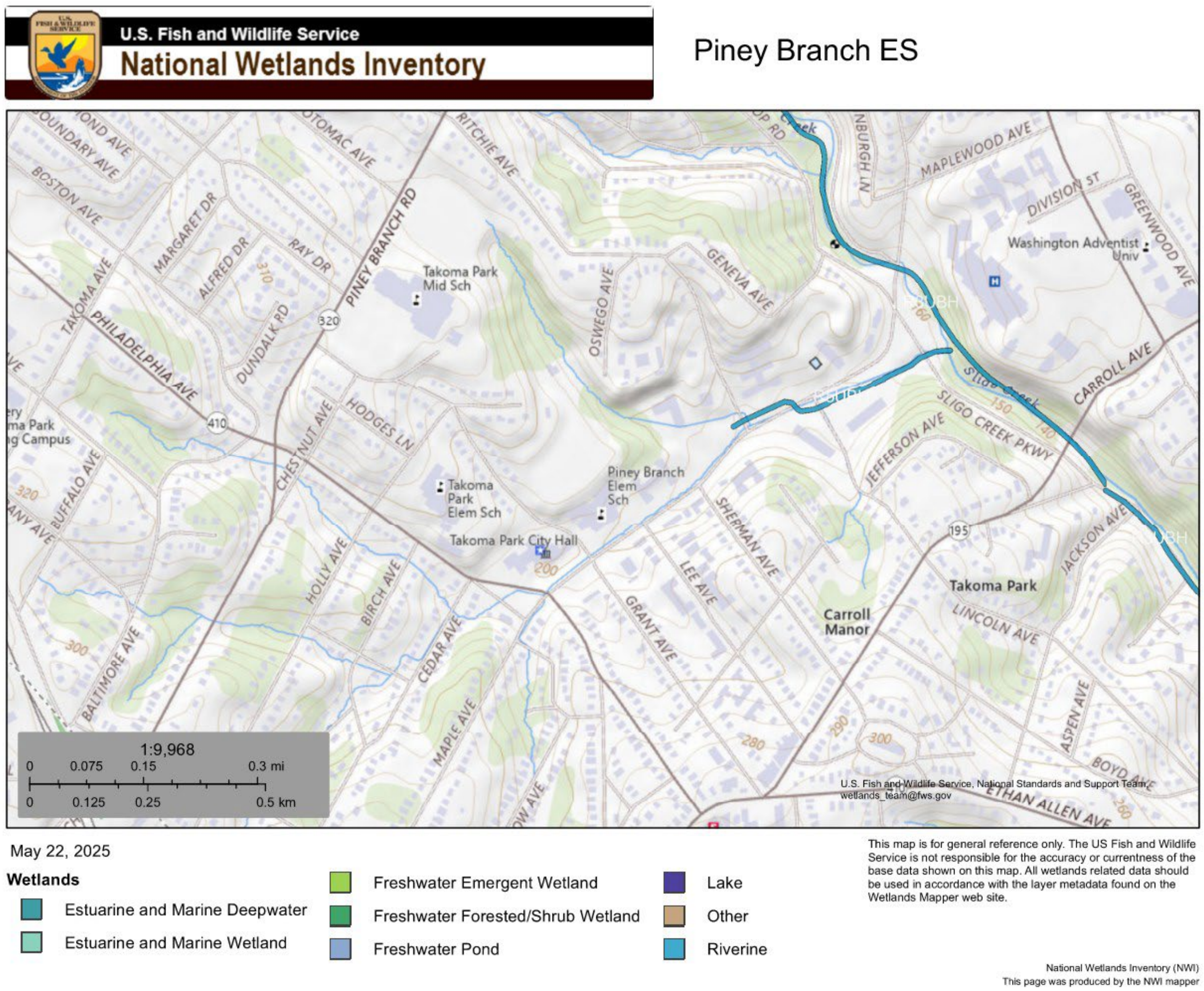
Soils for the site are noted as Gaila silt loam Glenelg (1C), and Urban land-Wheaton Complex (67UB).

Floodplain, Wetlands, and Streams:

The property is located outside the 100-yr floodplain per FEMA maps 24031C0460D (effective as of 9/29/2006).

There is however, a County mapped floodplain on the site (Floodplain #206448). Any impacts to this floodplain will require County review. It can be anticipated that a full floodplain study will be required for any new work. An increase in impervious areas may require storm water retention on site to offsite any negative impacts to the floodplain. The floodplain setback will need to be met for any proposed buildings.

There are currently no wetlands or streams on the property per the National Wetlands Inventory and based on field observations.



Forest and landscaping:

Most of the vegetation for the site is located on the adjacent Takoma Local Park. None of the on-site landscaped areas meet the criteria for designated forest. A few additional trees are scattered in front of the school building, and all appear to be in generally good condition. There do not appear to be any specimen trees on the property.

Existing Athletic Facilities:

There are currently no onsite athletic facilities. There is one grass play field located within Takoma-Piney Branch Local Park which is used by the school. Additionally, there are no compliant ADA access routes to the field, limiting accessibility for individuals with disabilities.

Existing Utilities:

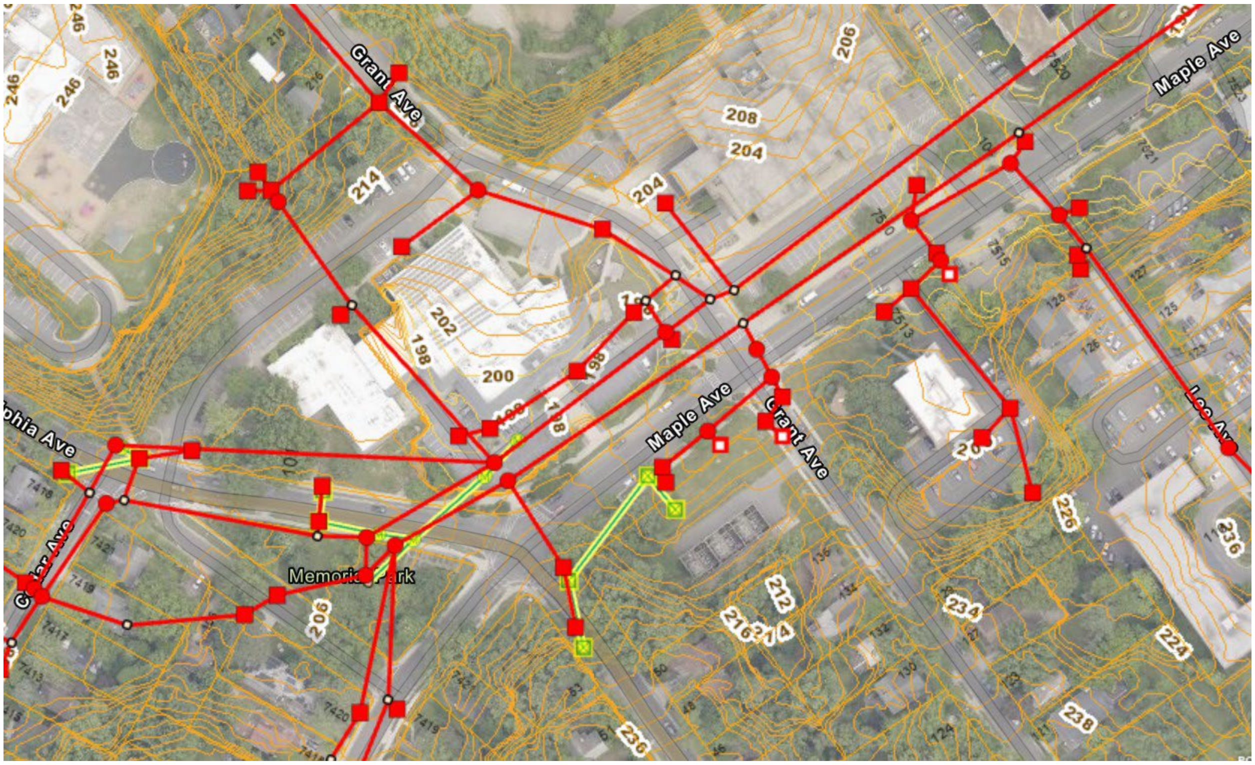
Water: The site is currently served by a 6” Ductile Iron waterline that comes from an 8” Ductile Iron line in Grant Ave.

Sanitary Sewer: The site currently drains to an 8” PVC sanitary sewer main that comes from Grant Ave and runs through the center of the school parking lot. The line continues down Maple Ave.

Storm Drainage:

The site currently has one major storm drain system and one additional planned system that both run under the parking lot. The constructed system consists of twin 72” RCP pipes that run near the face of the building. The additional planned/constructed system consists of twin 8’x12’ concrete box culverts. Plans were obtained from MCDPS for the planned box culverts, however, there is no evidence that the box culverts were constructed.

The site has limited existing storm drain infrastructure onsite with two connections Maple Avenue. One in the form of 15-inch RCP runs beneath the front parking lot and ties into the Maple Ave storm drain. There is also an 18-inch RCP connection located near the curb cut on Maple Ave, east of the main entrance.



Stormwater Management: There are currently no stormwater management facilities on site.

Electric and gas: Electric and gas for the site come from Maple Ave near the curb cut on Grant Ave. The gas is noted as a 1.5” line.

Site Considerations for all Options

Sediment and Erosion Control

Any project over 5,000 sf of disturbance will need to receive approval of the erosion and sediment control plan from Montgomery County DPS. Plans should conform to the 2011 Standards and Specifications for Soil Erosion and Sediment Control from Maryland Department of the Environment. It is anticipated that any major project will require compliance measures to be implemented. All projects will also require a stabilized construction entrance, inlet protection, silt or super silt fence, stockpile areas, concrete washouts, and permanent stabilization.

Site Demolition

All existing features, utilities, and improvements within the limits of disturbance for each option will have to be removed above and below grade. Care will be need to be taken to avoid disturbance to the existing large storm drain lines which run along the front of the property.

Grading

The site should be designed to have a balance between cut and fill to limit the amount of export or import for the site. All grass areas should be stabilized with sod.

Forestation

The project will not be clearing any forest. Large trees near the public sidewalk or along residential properties should be maintained when possible. The property will need to go through with a forest conservation exemption or a full forest conservation plan depending on the amount of work being proposed. All work will be reviewed by the Maryland National Capital Park and Planning Commission. Any work which extends onto Parks property will require a park permit and should limit tree impacts as much as is practical.

Site Improvements

- Any pavement shall meet the following requirements:
- Sidewalk shall be concrete (4,500 psi). Sidewalks shall be 5’ wide and 4” deep with WWF 6x6 and a 4” stone base.
- All curb and gutter shall be concrete (4,500 psi).
- All heavy duty concrete (4,500 psi) for ADA spaces or vehicular pavement shall be 8” thick with WWF 4x4 and 4” GAB.
- Asphalt pavement shall be 6” thick (2” asphalt surface course and 4” asphalt base course) with a 6” GAB.
- Heavy duty asphalt pavement for the bus loop or loading dock, shall be 6” thick (2” asphalt surface course and 4” asphalt base course) with an 8” GAB.
- All pavement shall be over an approved subgrade.

Proposed Utilities

Water – The waterline for the site shall be upgraded to an 8” DIP to serve the sprinkler system, hydrants, and domestic demand for the building. This will require a new water meter vault with easement. WSSC should be consulted if an inside meter can be provided due to potential conflicts with the existing utilities at the front of the school. A waiver will be required to use an inside meter. The existing waterline will require a service connection abandonment. The new line will require a new service connection.

- Sanitary Sewer – The existing sanitary sewer should be reused if possible. If a new line is necessary, a new line should be connected to the sanitary main that runs through the middle of the school parking lot.
- Gas – The existing service may not be suitable therefore new service is likely needed and will need to be coordinated with Washington Gas
- Electric – A new electric service is likely needed. The new service location should be closest to the new transformer to limit the amount of new electric primary service. All work is to be coordinated with PEPCO.
- Stormwater Management – All new work will need to meet Montgomery County ESD requirements. It is assumed that a combination of pervious pavement, micro-bioretentions, and other ESD practices will be needed. If ESD cannot be met, Chapter 3 or structural practices can be considered. Due to the lack of space onsite, it is assumed that the majority of stormwater management will be in underground systems. This would include a filtration facility such as a Bioclean Constructed Wetland or similar with a storage pipe or tank upstream of it.
- Storm Drainage – The floodplain will need to be addressed for any construction. This may require stormwater detention on site to avoid increasing the discharge to the existing storm drain. Given the high imperviousness of the existing site, it is likely that there will not be a significant increase in runoff with the development. Backwater valves may be necessary on any roof leader connection to the building depending on the flood elevations expected along Maple Avenue.

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Structural Existing Conditions Narrative

Introduction

Piney Branch Elementary School was constructed in the 1970's and is sited on a small plot of land in Takoma Park, Maryland. The building features a central area with offset floor elevations from the rest of the building. There are space constraints on the site which requires the evaluation of three options:

1. Renovate the existing building to meet current needs.
2. Retain and renovate some of the building and construct an addition.
3. Demolish the existing school and build a new one on the same site.

This narrative provides an assessment of the current structural condition of the school building to inform options 1 and 2, and the feasibility of structural modifications for options 2 and 3.

Structural Condition Assessment

This condition assessment includes a review of original construction documents provided by the owner, a visual observation of the interior and exterior of the building, which included limited visible structural elements, and observed deficiencies and recommendations for further investigation.

Existing construction documents provided by the owner consist of the original 1970 architectural and civil drawings and subsequent minor renovation drawings for architectural and mechanical. No original structural drawings have been provided.

The building is a 3-story steel, concrete, and masonry structure. The perimeter program is 3 stories, and the interior program is 2 stories. There is a small mechanical penthouse over the central area. The building structure is in fair condition based on the locations observed and the general lack of distress. There was some cracking noted in the brick façade in several locations. Subsequent review of the Matterport scan created by the architect showed some distress in a concrete framed area adjacent to the pool below the pool deck. Some rust was observed at steel lintels supporting brick over openings. These items appear minor and should be investigated and addressed during any renovation or addition work.

The existing architectural construction documents show much of the structure to be concrete-on-steel deck slabs supported by steel joists/beams and steel columns. The pool and gym areas are surrounded by concrete bearing walls supporting long-span steel beams and a small area at the dock is masonry bearing walls supporting steel joists/beam. Foundations are not indicated but assumed to be shallow column and wall footings.

Observed Deficiencies:

Pool Area

The long-span beams over the pool area showed minor corrosion at bearing locations (see Figure 1). Other structural elements above the pool appeared in good condition. There are existing prop columns in the mechanical area below the pool deck. The reason for their installation is unknown but would indicate weakened concrete structure due to corrosion (see Figure 2).

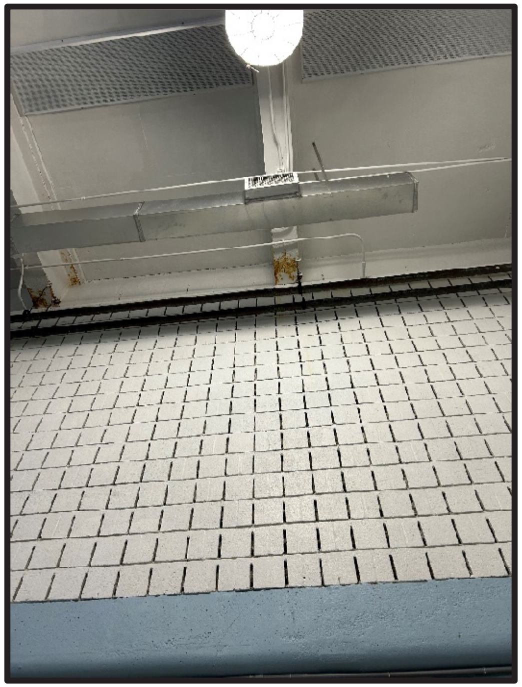

Figure 1 Beams at bearing location in pool area showing corrosion.

Figure 2 Prop columns below pool deck.

Gym Area

Evidence of water intrusion at control joints was observed at two locations (see Figure 3). There was no apparent deterioration of the concrete but it should be expected if the concrete has been exposed to water over a long period of time. Other structural elements appeared in good condition.

Figure 3 Water intrusion staining in gym floor.

Figure 4 Mechanical penthouse wall cracking.

Mechanical Penthouse

There was minor cracking observed in the masonry walls at corners (see Figure 4) but appears to be only aesthetic. There was evidence of water intrusion at the ceiling in the corners of the stair (see Figure 5). It was not clear if this area was a concrete slab or architectural finish and the existing drawings do not show conclusive information on the material.

Figure 5 Water intrusion in mechanical penthouse stair ceiling.

Figure 6 Displaced brick at top of parapet.

Exterior Façade

Most of the brick masonry at the top of the parapet showed some horizontal displacement (see Figure 6). Step cracking was observed in multiple areas (see Figure 7). Some lintels supporting brick façade over openings showed minor corrosion (see Figure 8). The cantilevered floor area at the rear of the building appeared to be deflecting down more than would be expected (see Figure 9).

Figure 7 Step cracking at corner of building.

Figure 8 Lintel over window opening showing corrosion.

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Figure 9 Deflected floor area at rear of building with horizontal reference line.

Recommendations:

The deficiencies noted above should be investigated prior to renovation or addition design phases to understand the causes and inform repairs.

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Basis of Design Narrative

Introduction

Piney Branch Elementary School was constructed in the 1970's and is sited on a small plot of land in Takoma Park, Maryland. The building features a central area with offset floor elevations from the rest of the building. There are space constraints on the site which require the evaluation of three options:

1. Renovate the existing building to meet current needs.
2. Retain and renovate some of the building and construct an addition (<50%).
3. Retain and renovate some of the building and construct an addition (>50%).
4. Demolish the existing school and build a new one on the same site.

This narrative provides the feasibility of structural modifications for options 1 through 3 and a description of structural work for all four options.

STRUCTURAL DESCRIPTION

Common Building Elements

In Options 1, 2, and 3 the existing structural system will be retained as appropriate for each architectural concept, reinforced where required, and added to with new structure where required. Reinforcement may consist of welded steel standard sections or plates or expanded concrete with bars doweled into existing concrete. Added structure may consist of new steel columns, beams, joists, or concrete walls, column footings, or continuous footings. The lateral force-resisting system will consist of new steel braced frames or may require the existing lateral system to be reinforced. The existing lateral system is unknown and will require extensive investigation but is assumed to be concrete shear walls at the pool and gym and masonry shear walls elsewhere. Any modifications to masonry walls may require reinforcement of the lateral force-resisting system.

In Option 4 the new structure will consist of a roof deck and concrete-on-steel deck floors supported by a steel frame. Foundations will consist of spread or continuous concrete footings and walls. The lateral force-resisting system will consist of steel braced frames.

Engineering Approach

Options 1a and 1b:

In Options 1a and 1b the existing structure remains as-is with limited anticipated modifications. Modifications to interior partition walls may require reinforcement of the lateral force-resisting system.

Options 2a and 2b:

In Options 2a and 2b new framing will be added to the southwest and southeast corners and the north side of the building for a bridge to the existing fields to the northwest. Steel deck at the roof and concrete slab-on-steel deck at the floors will be supported by steel beams and columns. New foundations will consist of continuous wall footings and spread column footings. Existing steel framing supporting new steel framing will require reinforcement and existing foundations supporting new framing will require reinforcement or replacement. The additional building area will require new steel braced frames or reinforcement of the existing lateral force-resisting system.

The central offset floor level will be removed and replaced at a lower level to align with the second floor. The third floor will be expanded into a portion of the area occupied by the central offset floor level. New floor deck and framing will be as described above. New framing will be supported by new columns strategically placed between existing columns to allow for new column footings to avoid existing column footings.

Options 3a and 3b:

In Options 3a and 3b all framing south of and above the pool and gym volumes will be demolished. New framing will be added to the south of the pool and gym volumes and over a portion of the pool and gym volumes. Steel deck at the roof and concrete slab-on-steel deck at the floors will be supported by steel beams and columns. New foundations will consist of continuous wall footings and spread column footings. New braced frames will provide the lateral force-resisting system. The exiting steel framing over the pool and gym that supports new framing or new occupancy program will require reinforcement. The pool/multipurpose room and gym bearing walls may require reinforcement and the pool/multipurpose room and gym foundations may require reinforcement or enlargement.

Options 4a and 4b:

In Options 4a and 4b the new structure will consist of a steel roof deck and concrete-on-steel deck floors supported by steel beams and columns. Foundations will consist of concrete walls, spread column footings, and continuous concrete wall footings. The lateral force-resisting system will consist of steel braced frames.

Pool:

In Options 1-3 noted above, Option ‘a’ keeps the pool substructure as-is and option ‘b’ inserts other program in place of the pool. For ‘b’ options, the pool will be filled in with geofoam below a concrete topping slab.

EXISTING CONDITIONS

MECHANICAL SYSTEMS

General

Piney Branch Elementary School (ES) was originally constructed around 1970, with a chiller replacement in 1998, and a systemic HVAC equipment replacement around 2013. It appears that most of the existing mechanical systems within the school date to the 2013 systemic replacement, except for the school's existing chilled water system (which was replaced around 1998) and boiler systems (which appear to date to the original 1970 construction).

Following is a detailed description of the existing mechanical, plumbing, and fire protection systems.

Heating Water Infrastructure Systems

Two natural gas-fired copper-fin type boilers produce heating water for Piney Branch ES. All boiler systems are located within the first floor mechanical room. Combustion air enters the boiler room through a single inline supply fan. While provided, this approach does not comply with the current International Mechanical Code (IMC) and CSD-1 requirements for combustion air.

Manufactured by Peerless Boiler (Model 210-26-W-S), the date these boilers were installed is unconfirmed but is believed to be around the buildings original 1970 date of construction. The boilers appeared to be in working condition during our site visit. While currently in working order, the existing boilers have exceeded their anticipated useful lifespan. Further, while the existing boilers are functioning adequately to satisfy the areas served, there does not appear to be surplus capacity available to support future expansion of the building without losing standby capacity if one boiler fails.

Existing Hydronic Boilers

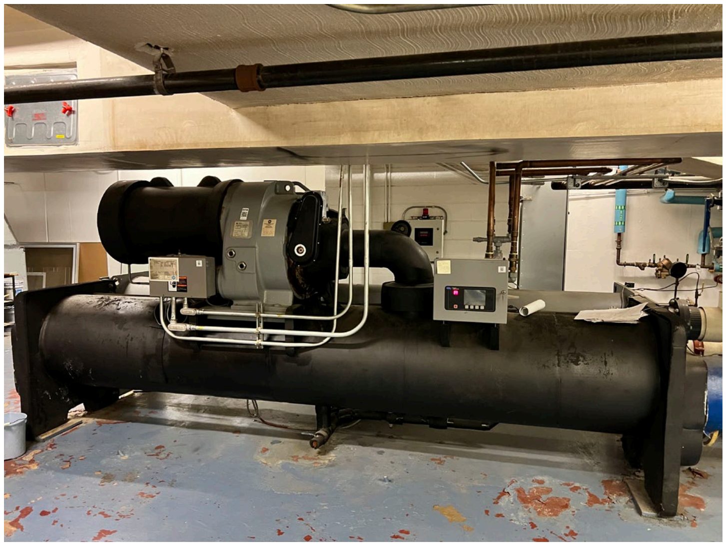
Each boiler is rated for a natural gas consumption rate of 5,250 cubic feet per hour (CFH) with a gross heating output of 4,200 MBH and a net heating output of 3,652 MBH. Individual vertical flues from each modular boiler section collect into a single breeching and extend horizontally to an inline draft fan which discharges into a common boiler stack that is routed vertically to the roof level.

Heating water generated by the boilers is supplied to the buildings four-pipe distribution system through a pair of base mounted end-suction type pumps. Manufactured by Bell & Gossett (Series 1510), these pumps are located within the ground floor mechanical room, equipped with constant speed pump motors, and appeared to be in fair working condition. Heating water pumps are arranged in a lead/lag setup with only one pump operating at any given time. Additional heating water equipment connected to the piping loop includes an air separator, chemical shot feeder, and expansion tank. All heating water pumping systems are located within the first floor mechanical room.

Existing Heating Water Pumps and Air Separator

Chilled Water Infrastructure Systems

Production of chilled water for Piney Branch ES is accomplished by a single water-cooled centrifugal chiller located in the first floor mechanical room. Manufactured by Carrier (model 19XR-3737264BFH64), this equipment has an available output capacity of approximately 350-tons, was installed around 1998, and appears in fair condition but is nearing the end of its anticipated useful life. There does not appear to be surplus capacity available to support any planned additions or expansions to the school. The chiller utilizes R-134A refrigerant. For safety purposes, a refrigerant monitoring system has been installed adjacent to the chiller for detection of refrigerant leaks.



Existing Water-Cooled Chiller

Heat rejection from the water-cooled chiller is accomplished by a single induced draft cooling tower located on the roof, above the penthouse mechanical room. The cooling tower is mounted on structural dunnage, with vibration isolation provided between the cooling tower base and the structure. Manufactured by Baltimore Aircoil Company (model 1-33269-1), this tower was installed around 1997 and is approaching the end of its anticipated useful life. Outdoor condenser water piping is constructed from PVC and is installed without heat trace. Chemical treatment for the cooling tower is located within the first floor mechanical room and positioned adjacent to the chiller.

Existing Cooling Tower

Chilled water is supplied to the building's four-pipe distribution system through a base mounted end-suction type pump. Condenser water is distributed between the chiller and cooling tower through an additional base mounted end-suction type pump. Chilled and condenser water pumping system redundancy is accomplished through a common standby base mounted end-suction pump, connected to both the chilled and condenser water systems. Manufactured by Bell & Gossett (Series 1510), all three pumps are located within the first floor mechanical room, equipped with constant speed motors, and appeared to be in fair condition. The chilled water distribution system is equipped with an air separator, shot feeder, and an expansion tank.

Existing Chilled and Condenser Water Pumps

Direct expansion (DX) type cooling is provided for a ductless split system serving the elevator machine room. The ductless split system is manufactured by Mitsubishi Electric (Model PUY-A18NKA7) with the condensing unit located within the first floor mechanical room and a wall mounted terminal unit located in the elevator machine room.

Existing Ductless Split System

HVAC Systems – Piney Branch ES

The existing heating, ventilating, and air conditioning (HVAC) systems vary slightly throughout the school. These systems are generally in good working condition and were installed as part of the school's 2014 and 2015 HVAC systemic renovations. The following is a breakdown of the various spaces and their associated HVAC system:

- Typical Classroom: Classroom areas throughout the school are provided with ventilation and space conditioning through a pair of indoor variable-air volume (VAV) modular air-handling units (AHU-7 and AHU-8), located within the penthouse mechanical room. Manufactured by Carrier (Model 39MN61), each air-handling unit is installed on a 4-inch high concrete housekeeping pad and appeared to be in good working condition. Air-handling unit systems are provided with individual chilled water cooling coils and hot water heating coils connected to the four-pipe distribution system. Three-way control valves with electronic actuators are provided at each coil for temperature control. Circulating pumps are provided at cooling coils. Each unit utilizes a remote inline type return fan (Twin City Fan; Model ATAD), with all supply and return fan motors provided with variable frequency drives manufactured by Danfoss (Model VLT). Supply airflow is ducted from each the air-handling unit to a series of single-duct type VAV terminals with hydronic heating coils, located throughout the building. These VAV terminal unit coils are provided with heating water from the building's four pipe distribution system and serve to maintain proper room temperature control within the areas served. Return air is transferred into the above ceiling plenum and returned to the associated air-handling unit system served.

Existing Air-Handling Unit (AHU-7)

Existing Return Air Fan (RF-7)

- Administration and Health Suite Areas: Similar to classroom areas, the first floor administration and health suite areas are provided with ventilation and space conditioning through an indoor VAV modular air-handling unit (AHU-1), located within the first floor mechanical room. Manufactured by Carrier (Model 39MN30), the air-handling unit is installed on a 4-inch high concrete housekeeping pad and appeared to be in good working condition. The unit is provided with individual chilled water cooling coils and hot water heating coils connected to the four-pipe distribution system. Three-way control valves with electronic actuators are provided at each coil for temperature control. The air-handling unit utilizes a remote centrifugal return fan, with the supply and return fan motors provided with variable frequency drives manufactured by Danfoss (Model VLT). Supply air is ducted from the air-handling unit to a series of single-duct type VAV terminals with hydronic heating coils, located throughout the areas served. These VAV terminal unit coils are provided with heating water from the building's four pipe distribution system and serve to maintain proper room temperature control for the areas served. Return air is transferred into the above ceiling plenum and returned to the associated air-handling unit system served.

Existing Air-Handling Unit (AHU-1)

Existing Return Air Fan (RF-1)

- All-Purpose Room: The all-purpose room is provided with ventilation and space conditioning through an indoor constant volume modular air-handling unit (AHU-5), located within the penthouse mechanical room. Manufactured by Carrier (Model 39MN17), the air-handling unit is installed on a 4-inch high concrete housekeeping pad and provided with individual chilled water cooling coils and hot water heating coils connected to the four-pipe distribution system. Three-way control valves with electronic actuators are provided at each coil for temperature control. The air-handling unit utilizes a remote centrifugal return fan (Twin City Fan; Model BCV-SW), with the supply and return fan motors provided with variable frequency drives manufactured by Danfoss (Model VLT) for balancing. Supply air is ducted from the air-handling unit to a series of supply registers located throughout the all-purpose room. Wall mounted return registers are positioned opposite of the supply registers and duct airflow back to the air-handling unit.

Existing Air-Handling Unit (AHU-5)

Existing Return Air Fan (RF-5)

- Kitchen: The kitchen is provided with ventilation and space conditioning through an indoor constant volume modular air-handling unit (AHU-6), located within the penthouse mechanical room. Manufactured by Carrier (Model 39MN14), the air-handling unit is installed on a 4-inch high concrete housekeeping pad and provided with individual chilled water cooling coils and hot water heating coils connected to the four-pipe distribution system. This air-handling unit, it's components, and associated ductwork systems are similar to those described previously for the all-purpose room.

Existing Air-Handling Unit (AHU-6)

- Locker Room and Pool Corridor Areas: The locker room and pool corridor areas are provided with ventilation and space conditioning through an indoor constant volume modular air-handling unit (AHU-2), located within the first floor mechanical room. Manufactured by Carrier (Model 39MN10), the air-handling unit is installed on a 4-inch high concrete housekeeping pad and appeared to be in good working condition. The unit is provided with individual chilled water cooling coils and hot water heating coils connected to the four-pipe distribution system. Three-way control valves with electronic actuators are provided at each coil for temperature control. The air-handling unit does not include a return fan. Supply air is ducted from the air-handling unit to a series of supply diffusers located throughout the areas served. The supply fan motor is provided with a variable frequency drives manufactured by Danfoss (Model VLT). A pair of duct mounted heating coils are also provided for zone temperature control, with one coil dedicated to the locker room area and one coil dedicated to the corridor area. A limited quantity of return air is transferred into the above ceiling plenum and returned to the air-handling unit system served.

Existing Air-Handling Unit (AHU-2)

- Gymnasium: The gymnasium is provided with ventilation and space conditioning through an indoor constant volume modular air-handling unit (AHU-3), located within a mechanical / storage room positioned adjacent to the gymnasium. Manufactured by Carrier (Model 39MN21), the air-handling unit is installed on a 4-inch high concrete housekeeping pad and appeared to be in good working condition. The unit is provided with individual chilled water cooling coils and hot water heating coils connected to the four-pipe distribution system. Three-way control valves with electronic actuators are provided at each coil for temperature control. The air-handling unit utilizes a remote inline return fan (Twin City Fan; Model TSL), with the supply and return fan motors provided with variable frequency drives manufactured by Danfoss (Model VLT) for balancing. Supply air is ducted from the air-handling unit to a series of overhead supply diffusers positioned high within the gymnasium area. Wall mounted return grilles are positioned along the mechanical room wall and ducted back to the associated air-handling unit.

Existing Air-Handling Unit (AHU-3)

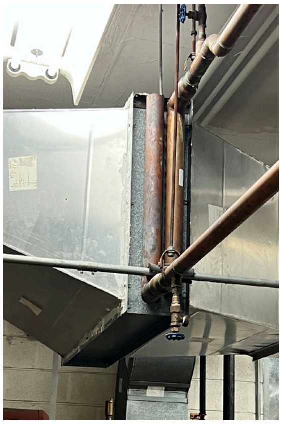
Existing Return Air Fan (RF-3)

- Pool Area: A pair of indoor single-zone constant volume air-handling units provide space conditioning and ventilation airflow for the pool area. Manufactured by Pool Pak (Model AW2600), this equipment was installed around 1999, is positioned within a mechanical room located adjacent to the pool, and appeared to be in fair condition during our site visit. Each unit is provided with a remote air-cooled condensing unit, located at the roof level above the pool mechanical room. Supply and return airflow from this equipment is ducted to a series of aluminum sidewall air devices located throughout the pool area. A gas-fired fire-tube boiler is provided within the pool mechanical room for general pool water heating and supplementary pool room space heating (via duct mounted heating coils). Manufactured by Lochinvar (Model FTX600N), this equipment has a gross output rating of approximately 585 MBH and was in good condition during our site visit. The flue from this boiler extends vertically and terminates at the roof level near the pool unit air-cooled condensing units. Heating water generated by the boiler is decoupled from the pool water by a plate and frame heat exchanger. A single inline pump and piping loop is provided for circulating water through the boiler, heat exchanger, and duct heating coils. A single base mounted pump and piping loop is provided for circulating water between the pool, pool air handling unit, and plate and frame heat exchanger. Additional heating water equipment connected to the boiler piping loop includes an air separator and expansion tank.

Existing Pool Air-Handling Unit

Existing Air-Cooled Condensing Unit

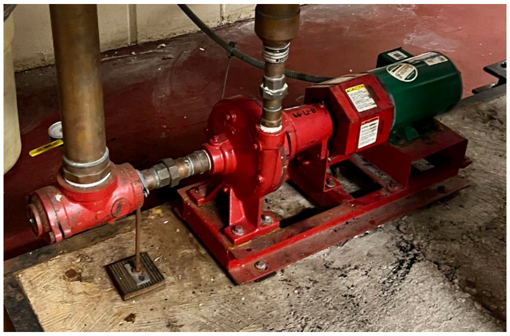
Existing Pool Boiler



Existing Duct Heating Coil

Existing Heat Exchanger

Existing Boiler Circulator Pump



Existing Pool Circulator Pump

- Building Exhaust Systems: A series of roof mounted and inline fans remove exhaust airflow throughout the school. The existing fans, while operational, generally appeared to be in fair to poor working condition.

Existing Exhaust Fan

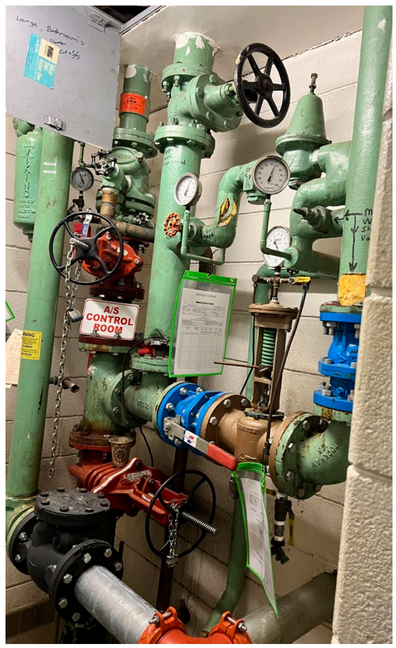
Automatic Temperature Control (ATC) Systems

The existing control system is primarily comprised of direct digital control (DDC) components manufactured by HI Solutions. DDC devices, including major air-handling unit valve and damper components, are provided with electronic actuation. Building control components are interfaced with the central MCPS energy management control system for occupied/unoccupied settings and other energy management system routines. While no pneumatic control components were found, a duplex type air compressor system complete with horizontal storage tank, is located within the ground floor mechanical room and appears to have previously served the building's pneumatic control components. Manufactured by Quincy, control air supplied from this compressor is fed through a refrigerated dryer system. The air compressor system appeared to be in good condition during our site visit. Replacement of any remaining pneumatic control devices with electronically operated DDC type components is recommended under any planned building renovations.

PLUMBING SYSTEMS

Domestic Cold Water and Associated Domestic Water Piping

Piney Branch Elementary School is served from the county water system through a 6-inch combination fire and domestic water service, entering the building within a storage room located adjacent to the kitchen area. A 3-inch domestic water main with pressure reducing valve extends from this incoming service to support the building's domestic water requirements. Currently, no backflow preventer is provided at the domestic water service entrance. The installed configuration does not comply with current WSSC standards, which require the water service rise above grade within 5 feet of the buildings exterior wall and that both fire protection and domestic water backflow preventers be provided within 5 feet of the water main entering the building. It is anticipated that limited surplus capacity exists for the existing 3-inch domestic cold water main. Most of the school's domestic water piping systems (including cold water, hot water, and hot water return piping) date back to the school's original construction in 1970. These piping systems and associated piping components (valves, fittings, and piping insulation) have exceeded their useful service life and are recommended for replacement as part of any planned building renovations.



Existing Combination Water Service

Domestic Hot Water Equipment

Domestic hot water is generated by a pair of 85-gallon gas-fired water heaters, manufactured by State Industries (Model SBD-85-365-NEA 118). These water heaters appeared recently replaced and in good working condition. Each heater is equipped with a 365 MBH gas burner that produces 318 gallons per hour recovery. The flues from these water heaters extend horizontally across the first floor mechanical room and are provided with a powered exhaust fan at each flue termination. The hot water system is equipped with a domestic water circulation pump; however, no thermostatic mixing valve or expansion tank is currently provided. It is anticipated that limited surplus capacity exists for existing the hot water heaters.

Existing Domestic Water Heaters

A single of domestic hot water circulation pump maintains a continuous hot water flow throughout the areas served. The systems are not equipped with a thermostatic mixing valve, which is typically provided on today's new systems. It is anticipated that minimal surplus capacity exists for the water heaters.

Sanitary Waste, Vent, and Storm Water Piping

Like the domestic water piping systems, a majority of the existing above- and below-grade sanitary waste, vent, and storm water piping systems date back to the school's original construction and are approximately 55-years in age. A majority of these existing piping systems have exceeded their useful service life are recommended for replacement as part of any planned building renovations.

Plumbing Fixtures

Plumbing fixtures throughout the school generally appear to be in good condition. The water closets are floor mounted, urinals are wall-hung, and the lavatories are individual wall-hung type.

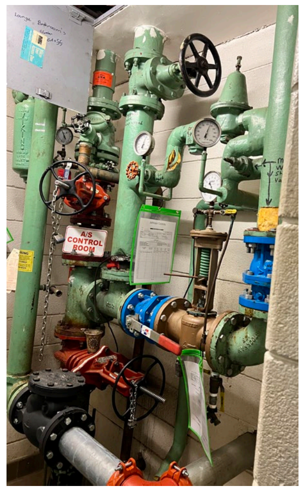
Natural Gas Service and Piping

Natural gas is provided to the school by Washington Gas with the existing gas service entrance and meter (Meter # B14742) located within the first floor mechanical room. While no gauges were present at the existing gas service, it is anticipated that a 2-PSI gas pressure is currently provided and that this existing service has sufficient capacity to support any planned building renovations. Interior gas piping is primarily limited to the existing basement mechanical room area and appeared to be in fair condition during our site visit.

Existing Gas Service and Washington Gas Meter

FIRE PROTECTION SYSTEMS

Piney Branch Elementary School is currently provided with fire detection and sprinkler coverage throughout. The building is provided with a 6-inch combination fire and domestic water service as described in the plumbing systems narrative above. The fire protection service is separated from the domestic water service by an alarm check valve. The current configuration does not have appropriate backflow prevention and does need meet the current WSSC standards (see plumbing system narrative for additional information).



Existing Combination Water Service

A sprinkler main extends from the service entrance room to serve sprinkler heads located throughout the building. Sprinkler system components appeared to be in fair condition during our site visit. These piping systems and associated piping components (valves & fittings) have exceeded their useful service life and are recommended for replacement as part of any planned building renovations.

The existing fire alarm control panel (FACP), located in the main electrical room, is manufactured by Fire-Lite Alarms, Model MS-9200UD, with DVS-50 voice evacuation panel. There is a fire alarm annunciator panel (FAAP) with graphic display and indicator lights in the main entrance lobby. Fire alarm devices include manual pull stations, duct and area smoke detectors, and wall mounted audible/visual notification devices (speaker/strobes and strobes).

Fire Alarm Control Panel and Voice Control Panel

ELECTRICAL SYSTEMS

General

Piney Branch Elementary School was constructed in 1973. The following is a description of the existing electrical service, power distribution, lighting and lighting controls, voice/data, public address, and security (door access control, intrusion detection, video surveillance) systems.

Electrical Service

The existing electrical service to Piney Branch Elementary School is provided by Pepco from an overhead utility pole near the intersection of Maple Avenue and Lee Avenue on the northwest side of Maple Avenue. The primary utility service conductors run down the utility pole and underground to an underground utility vault located near the loading dock at the east corner of the school. Secondary service feeders run in underground conduits from the secondary of the Pepco utility transformer, located in the underground utility vault, to the CT cabinet of the main switchboard located in the main electrical room near the loading dock on Level A of the school. The Pepco meter (KZD351047594) is located in the main electrical room to the left of the main switchboard.

Utility Pole at Maple and Lee

Utility Transformer in Underground Utility Vault

Utility Meter

Power Distribution

The main switchboard is by Square D Company, "Power-Style" Switchboard, rated at 277/480 volts, 3 phase, 4 wire, with a CT cabinet section, main section with 1600-ampere "Bolt-Loc" pressure contact main switch, 1600-ampere horizontal bus, and circuit breaker distribution section.

The distribution section has feeder circuit breakers serving Panel AH2 (225A), Panel BL3 (225A), Panel BH1 (225A), Panel AH3 (225A), Panel AH4 (225A), Panel PH1 (225A), Chiller (500A), Elevator (100A), Panel AH1 (100A), life safety Panel HV-1 (40A), and non-life safety standby Panel HV-2 (80A). There are two 225-ampere circuit breakers labeled spare, but are in the ON position. The left side of the distribution section has 13.5 inches of spaces for future circuit breakers. The right side has nine 4.5-inch spaces for future 100-ampere frame circuit breakers.

Main Service Switchboard

Generator Distribution

An indoor natural-gas generator was installed in 2013 and is located the main storage room / emergency generator room, adjacent to the main electrical room. The generator is by Kohler Power Systems, rated at 80-kW, 277/480 volts, 3 phase, 4-wire. The generator serves Panel HV-1 and Panel HV-2 via automatic transfer switches located in the same room. Panel HV-1 serves exit lights and Panel LV-1 (via 15-kVA transformer). Panel LV-1 serves fire alarm equipment and emergency lighting. Panel HV-2 serves circulation pumps and Panel LV-2 (via 45-kVA transformer). Panel LV-2 serves the intercom/public address system, and kitchen walk-in freezer and walk-in refrigerator.

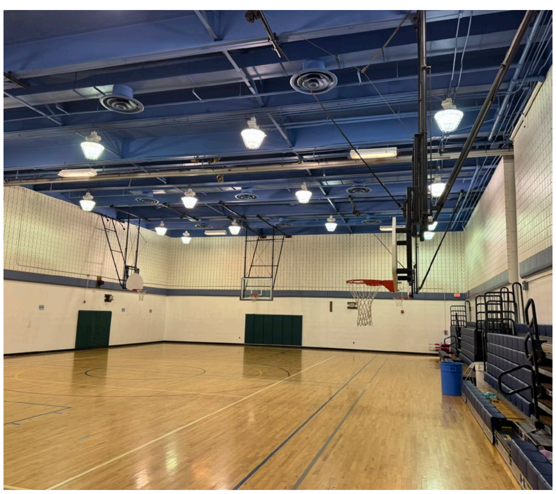
Indoor Generator and Automatic Transfer Switches

Lighting and Lighting Controls

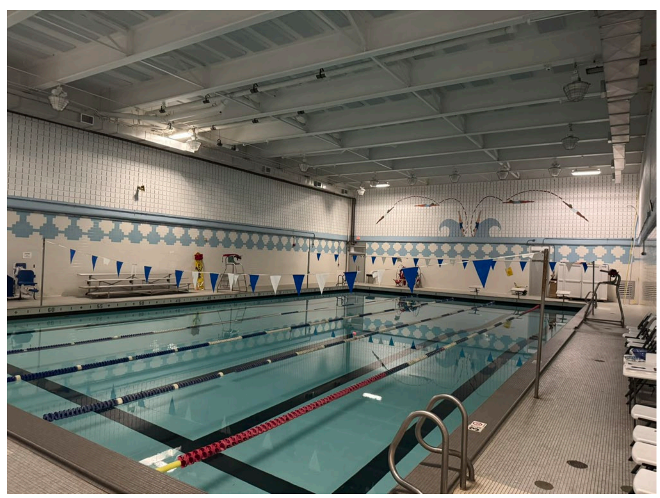
Fluorescent lighting is primarily used throughout the school. The main entrance lobby, corridors, media center, cafeteria, kitchen, and classrooms have 2'x4' recessed fluorescent troffer luminaires (lighting fixtures) with prismatic lens and linear fluorescent lamps. The cafeteria also has aimable downlight luminaires for the stage area. The main office area and teacher's lounge use 2'x4' recessed fluorescent basket-type luminaires. The gymnasium and pool area have high-bay type luminaires. The pool area high-bay luminaires have been retrofitted with LED light sources. The main electrical room and emergency generator room have round open pendant luminaires with screw-type lamps. The mechanical rooms and penthouse have industrial type fluorescent luminaires. Exit signs have thermoplastic housing and red lettering.

Typical Classroom Lighting

Typical Corridor Lighting



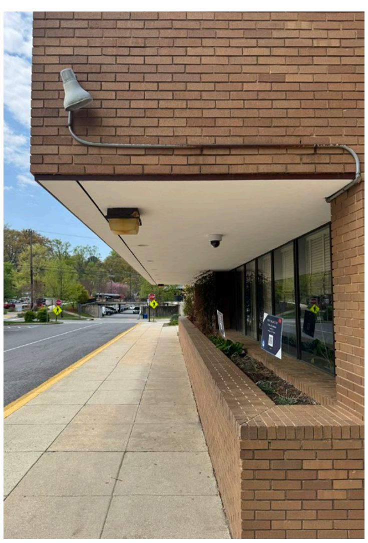
Main Gym



Swimming Pool

Cafeteria

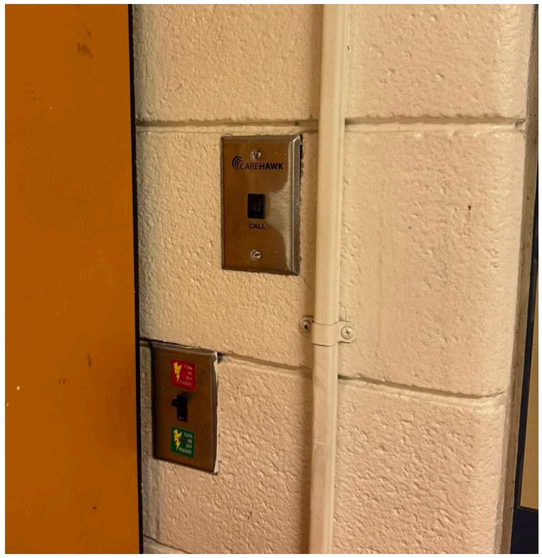
Exterior lighting at exterior soffits and canopies consists of ceiling recessed mounted lensed downlights and ceiling surface mounted square luminaires with bronze finish and yellowing acrylic lenses. Exterior building mounted lighting consists of wall mounted flood lights and wall packs. There are three light poles, each with flood lights for the parking areas.



Exterior Lighting Fixtures

Exterior Pole Mounted Lighting Fixture

Line-voltage toggle switches are used to control lighting in each space. Piney Branch ES does not use occupancy sensors to automatically turn off lighting when rooms are unoccupied.



Typical Classroom Lighting Controls

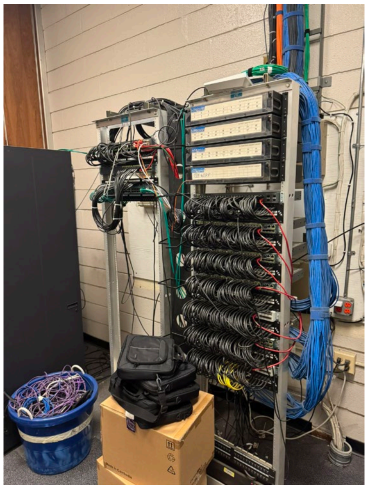
Lighting and lighting controls do not meet current energy-code requirements (i.e., 2021 International Energy Conservation Code) for lighting power density (watts per square foot), occupant sensor controls, and light-reduction controls (dimming).

Data and Voice Systems

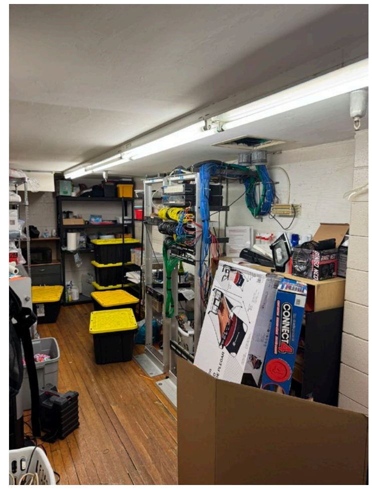
The main data equipment is located in a room labeled "Conference Room B" within the media center, which consists of two main distribution frame (MDF) data racks and a Dell server rack. Two intermediate distribution frame (IDF) data racks are found in the storage room accessed from the cafeteria stage. MDF and IDF racks have data fiber optic distribution enclosures (light interface units) and patch panels by Superior Modular Products, and electronic data switches by Cisco.

Category 5/5e cabling distribution system is installed in the school to provide network connectivity. Each typical classroom has both teacher and student outlets. Wireless access points by Cisco are mounted on the ceilings.

There are 110-style voice connecting blocks on the walls behind the MDF and IDF racks. The telephone system is a separate voice system for telephones in the school offices. There are "Impression" voice handsets by Comdial in the main office area.



Data Racks in MDF

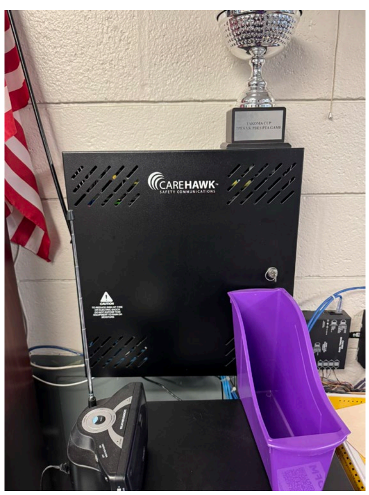


Data Racks in IDF

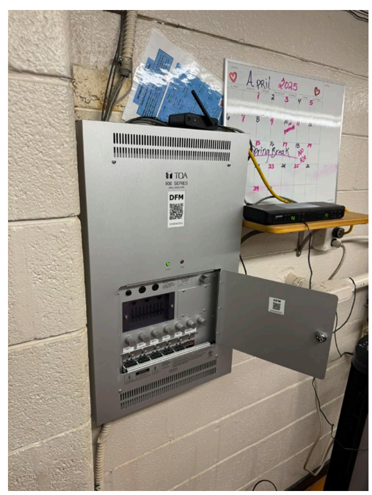
Intercom and Sound Systems

The public address/intercom equipment is by CareHawk Safety Communications, located in the main office area. The system has the capability to perform select local calls to classrooms or paging throughout the entire school. Each classroom has a ceiling mounted speaker and a wall mounted call switch. Ceiling or wall speakers are located in the corridors. There are CareHawk administration control station handsets in the main office area.

There is a sound system cabinet in the storage room accessed from the cafeteria stage. The sound system cabinet is connected to two large performance speakers located in the cafeteria on each side of the stage.



Public Address System



Platform Sound System

Video and Audio/Visual Systems

There is a media retrieval video system rack in the room within the media center next to the MDF racks, which contain equipment by Blonder Tongue, and video cassette recorder (VCR) and DVD players by JVC. Coaxial video cable splitters/taps are found behind the rack. "F" connector type video outlets are located in rooms throughout the school. There are audio/visual Boxlight smart boards in the media center and in classrooms.

Media Retrieval Video System Rack

Security Systems

The intrusion detection system is by Napco (Gemini), with the control panel located in the room within the media center, behind the MDF racks. There are two Napco keypads located in the main office area. There are ceiling mounted and wall mounted intrusion detection motion detectors/sensors in the corridors. There is a door card access control panel located adjacent to the intrusion detection control panel. There is an exterior wall mounted dome-type video surveillance camera installed at the building entrance.

Intrusion Detection System Control Panel

OPTION 1a – RENOVATION CONCEPT (WITH POOL)

MECHANICAL SYSTEMS

General

The proposed Option #1a – Renovation concept (with pool) retains the existing Piney Branch ES in its entirety (including the pool area). Existing spaces throughout the school will be renovated in their entirety under the scope of this project option. To support these renovations, the existing chilled water infrastructure, heating water infrastructure, and localized HVAC equipment will be replaced throughout the school.

The following mechanical system is recommended to support the proposed renovation concept. This mechanical system provides a high level of overall energy efficiency and good thermal comfort for building occupants.

Heating and Cooling Infrastructure Systems

A centralized air-to-water heat pump unit system is recommended to support the proposed renovation concept. This type of mechanical system provides the ability to have independent heating or cooling year-round, while delivering an extremely high level of overall building energy efficiency.

> Chilled/Heating Water Side of Heat Exchanger: A pair of air-to-water, two-pipe, heat pump chillers will generate either heating water or chilled water for the centralized air-to-water heat pump system. These heat pump chillers will be located on the roof, within the existing cooling tower enclosure, and positioned adjacent to the penthouse mechanical room. Three base-mounted chilled/heating water pumps (two active and one stand-by) will circulate a propylene glycol-water mixture between the heat pump chillers and the primary (source) side of the system's plate-and-frame heat exchanger. The heat exchanger and the chilled/heating water pumping systems will be located within the first floor mechanical room. Chilled/heating water pumps will be provided with N+1 redundancy such that the operation of the building can be maintained in the event of a single pump failure. In addition, these pumping systems will be equipped with variable frequency drives for use during system balancing. Major chilled/heating water infrastructure components, including the chilled/heating water pumps, a plate-and-frame heat exchanger, a glycol feeder, an air separator, an expansion tank, and a buffer tank will also be located within the first floor mechanical room.

> Heat Pump Loop Side of Heat Exchanger: Two base-mounted heat pump loop distribution pumps (one active and one stand-by) will circulate an all-water fluid between the secondary (load) side of the plate-and-frame heat exchanger and the water-source heat pump units located throughout the building. Heat pump loop distribution pumping systems will also be located within the first floor mechanical room and be provided with N+1 redundancy such that the operation of the building can be maintained in the event of a single pump failure. In addition, these pumping systems will be equipped with variable frequency drives for reduced energy consumption during periods of reduced system demand. Major heat pump loop infrastructure components, including the heat pump loop distribution pumps, a plate-and-frame heat exchanger (described previously), an air separator, and an expansion tank will also be located within the first floor mechanical room.

General Classroom HVAC Systems

Extended range vertical heat pump units will be provided for space conditioning within the general classroom areas, with these units located within mechanical closets positioned near the area served. Doors for all mechanical closets will be accessed from the corridor for routine maintenance. Heat pump units will generally be equipped with two-stage type compressors, helping to extend compressor life and improve the overall energy efficiency of these systems under part load operation.

A series of indoor DOAS units with supply and exhaust fans, enthalpy wheels for pre-conditioning outdoor air, DX heat pump coils with water-cooled compressors, and hot gas reheat coils for tempering supply air will be provided to deliver conditioned ventilation airflow to the classroom areas served. DOAS units will be installed on 4-inch concrete pads in the penthouse mechanical room. Airflow supplied from these DOAS units will be dehumidified, conditioned, and delivered to each space directly. Exhaust airflow from classrooms, restrooms, and storage room areas will be routed through each DOAS unit's enthalpy wheel for pre-conditioning of outdoor air.

The use of demand control ventilation within the classroom areas will be provided to assist with reducing the school's overall energy consumption. To accomplish this control strategy, a series of VAV retrofit-type air terminal units will be installed within the conditioned outdoor air ductwork systems. Each classroom will be provided with a dedicated VAV air terminal unit, regulating the quantity of conditioned outdoor air delivered to each space based on the actual room carbon dioxide levels.

Music and Art Classroom HVAC Systems

The music and art classroom areas will be provided with a similar HVAC system approach as the general classroom areas. This HVAC system approach includes extended range vertical heat pump units for space conditioning, DOAS units for ventilation, and demand control ventilation via VAV retrofit-type air terminal units. Heat pump units will continue to be positioned within mechanical closets, with supply and return air ductwork extending from these units to the area served.

Administration, Guidance, and Health Suite HVAC Systems

The administration, guidance, and administrative support areas will be provided with space conditioning through a dedicated variable refrigerant flow (VRF) system. This system will be complete with heat recovery type water-cooled condensing units connected to the heat pump loop. Condensing units will be located within mechanical rooms near the spaces served. Doors to mechanical rooms will be accessible from the corridor for routine maintenance.

The use of ceiling cassette type VRF terminal units is anticipated, promoting sufficient clearance access for filter replacement. Multi-occupant spaces will be provided with 3'x3' cassettes with high efficiency (MERV 10 or higher) disposable filters. Single occupant spaces will be provided with 2'x2' cassettes with the VRF manufacturer's standard washable filter.

A dedicated DOAS unit with supply and exhaust fans, an enthalpy wheel for pre-conditioning outdoor air, a hot gas reheat coil for tempering supply air, and a DX heat pump coil with water-cooled compressors will be provided to deliver conditioned ventilation airflow to the administration areas served. The DOAS unit will be installed on a 4-inch concrete pad in the penthouse mechanical room. Airflow supplied from this DOAS unit will be dehumidified, conditioned, and delivered directly to each space. Exhaust airflow from the offices, restrooms, and storage room areas will be routed through the DOAS unit's enthalpy wheel for pre-conditioning of outdoor air.

Media Center HVAC System

An extended range large capacity vertical heat pump unit will be provided for space conditioning within the media center area. This heat pump unit will be similar to those provided for the school's general classroom areas; however, also provided with multiple compressors and hot-gas reheat to accomplish room level humidity control. This heat pump unit will be positioned with the penthouse mechanical room. Conditioned ventilation air for the media center will be provided by the classroom DOAS units described previously.

Gymnasium HVAC Systems

An indoor air handling unit with heat pump type water-cooled compressor, and hot gas reheat coil will provide space conditioning and ventilation for the gymnasium area. The water-cooled compressors will be connected to the heat pump loop. Full airside economizer and enthalpy wheel energy recovery devices will be provided where required by the International Energy Conservation Code. Demand control ventilation will be provided for the units serving the Gymnasium. This air handling unit will be positioned within a mechanical room located adjacent to the gymnasium space

Cafe/Multi-Purpose Room HVAC Systems

An indoor air handling unit with heat pump type water-cooled compressor, and hot gas reheat coil will provide space conditioning and ventilation for the cafe/multipurpose room. The water-cooled compressor will be connected to the heat pump loop. Full airside economizer and enthalpy wheel energy recovery devices will be provided where required by the International Energy Conservation Code. Demand control ventilation will be provided for the units serving the Cafe/Multipurpose Room. This air handling unit will be located within the penthouse mechanical room.

Kitchen HVAC Systems

An indoor air handling unit with heat pump type water-cooled compressor, and hot gas reheat coil will provide space conditioning and ventilation for the kitchen. The air handling unit will be located within the penthouse mechanical room and the water-cooled compressor will be connected to the heat pump loop. Full airside economizer and enthalpy wheel energy recovery devices will be provided where required by the International Energy Conservation Code. General exhaust from the kitchen restroom, storage rooms, and the kitchen space itself will be routed to a rooftop exhaust fan. A separate rooftop exhaust fan will also be provided for serving the kitchen's associated exhaust hood.

Pool Area HVAC Systems

Space conditioning and ventilation for the pool will be provided by a pair of indoor single-zone variable air volume, heat pump type, air-handling units. The heat pump units will be air-source with split condensing units located on the roof of the pool area. The air handling unit will be positioned inside the mechanical room adjacent to the pool area. Auxiliary heating will be provided by two new hydronic duct heating coils. Heating water will be generated by an air-source, heat pump type, water heater. A new inline pump, expansion tank, and air separator will be provided for the heating water system. A new heat exchanger and pool water pump will also be provided with a pool water circuit piped to the air handling units and heat exchanger for pool water heating.

Miscellaneous Building Areas

Data, Telecomm, and Elevator Room will be served by ductless split systems. Heating-only type spaces such as mechanical rooms, electrical rooms, stairs, storage rooms, and entry vestibules will be provided with electric cabinet and propeller unit heaters. In addition, a dedicated switch-operated exhaust fan will also be provided within the health suite area and within the administration workroom.

Building Automation Control System

Automatic temperature controls will be direct digital type controls (DDC). Actuation will be electric / electronic for all systems. All system components will be installed in accordance with MCPS standards and networked to the existing front-end server located at the MCPS Energy Management Office.

PLUMBING SYSTEMS

Domestic Water Piping Systems (Including Water Service Entrance)

A new combination fire/water service will enter the school within the first floor mechanical room. The new combination fire/water service will be capable of supporting both the fire and water service demands of the new school. A new domestic water service, complete with basket strainer and backflow preventer will separate the domestic water and fire services prior to distributing water throughout the school. Domestic water piping will be distributed from this first floor mechanical room area to plumbing fixtures and equipment located throughout the school. The existing domestic water piping will be replaced throughout the entire school.

Domestic Hot Water Heater System

Domestic hot water for the proposed renovation concept will be generated by a pair of electric resistance tank type domestic water heaters. Domestic hot water will be generated at 140-degrees F, with 120-degrees F domestic hot water distributed throughout the school. Local thermostatic mixing valves will reduce the water temperature to 110-degrees F at hand washing fixtures. The piping loop will be complete with a dedicated hot water circulation pump and expansion tank.

Storm Water Piping Systems

Storm water drainage, including roof drains, overflow drains, and storm water piping systems will be replaced to the greatest extent possible throughout the entire school. Above- and below-grade storm water piping will be constructed from PVC material. All storm water piping systems will exit the school at various locations and coordinate with available site piping connections provided for the proposed renovation option.

Roof drains with interior storm water piping are anticipated for flat roof areas. Roof gutters with exterior downspouts are anticipated for sloped roof areas. Cast iron storm water leader shoes will be provided where downspouts transition to below grade storm water piping before connecting to the site storm water system.

Sanitary and Vent Piping Systems

Sanitary waste and vent piping systems will be replaced to the greatest extent possible throughout the entire school. Above- and below-grade sanitary and vent piping will be constructed from PVC material. Vent piping will terminate at the roof level, with a minimum 25-foot separation provided between vent piping terminations and any outdoor air intake locations. Sanitary piping systems will exit the building at various locations and will coordinate with the available site piping connections provided for the proposed renovation option.

The following special sanitary and vent piping systems are anticipated:

- Equipment and sinks that may discharge grease into the sanitary system from the kitchen will be piped to a new underground concrete grease interceptor. The discharge from this interceptor will be connected to site sanitary piping system.
- Sinks within the art classrooms will be provided with solids interceptors, collecting debris and preventing it from entering the site sanitary piping system.

Plumbing Fixtures

Replacement of the existing plumbing fixtures throughout the school should be considered under Option 1a, given the amount of domestic water and sanitary waste and vent piping work being performed. Institutional grade replacement plumbing fixtures will be provided and include floor-mounted water closets utilizing 1.28 gallon per flush valves, pint flush (0.125 gallon per flush) wall-hung urinals, and wall-hung lavatories with hot and cold water faucets with low flow aerators. The water consumption figures noted are equal to or less than what is required by the current plumbing code and for promoting good water conservation practices. All new plumbing fixtures will be ADA compliant.

Gas Piping Systems

The existing Piney Branch ES indoor natural gas service, associated meter, and interior gas piping will be replaced to accommodate the proposed renovation scope of work. A new natural gas service will be provided by Washington Gas for the school. The gas service meter and pressure reducing station will be positioned outdoors and located near the main mechanical room. Gas piping will serve the emergency generator only.

FIRE PROTECTION SYSTEMS

Sprinkler System

The entire building will be fully sprinklered, with the sprinkler system separated into several zones that will match the fire alarm pull zones for the building. The existing sprinkler heads and associated branch sprinkler piping will be removed and replaced throughout the school, with new sprinkler piping extending from the new combination fire/water service entering the school within the first floor mechanical room.

A fire flow test will be performed during the early stages of design to confirm the available municipal water pressure and determine if a fire pump is required to support the proposed sprinkler system. A fire pump is not currently anticipated based on the available water pressure at the existing school. All work will be specified to conform to standards of the National Fire Protection Association (NFPA) and will include requirements for performance verification through hydraulic calculations.

Fire Detection and Alarm System

The existing fire detection and alarm system will be demolished and replaced throughout the entire building. The existing fire detection and alarm system has one-way voice communication function and may be reused.

The fire detection and alarm system will comply with State of Maryland Fire Code, local authorities having jurisdiction, International Building Code, and NFPA. The fire detection and alarm system will be a stand-alone, addressable, and will have voice evacuation capability. The main fire alarm control panel (FACP) will be located either in the main telecom room or in a location as directed by MCPS. The FACP will be equipped with battery backup. The fire alarm annunciator with graphic display and adjacent keypad will be located at the main building entrance vestibule or lobby.

Initiation devices include manual pull stations, smoke detectors, duct smoke detectors, heat detectors, and carbon monoxide detectors (where gas-fired equipment is used). Notification devices include fire alarm combination speaker/strobe devices, strobes, and fire alarm speakers. The fire detection and alarm system will be connected to the lighting control system to facilitate the automatic illumination of the path of egress upon initiation of the fire alarm system.

ELECTRICAL SYSTEMS

General

The proposed Option #1a - Renewal and zero-percent demolition concept retains the entire Piney Branch ES building area. The existing electrical distribution equipment, lighting fixtures, lighting controls, receptacles, voice/data system, public address system, and security system components will be demolished and replaced. A new main electrical room and auxiliary electrical room will be provided within the existing building foot print within the existing main mechanical space. Existing spaces within the school will be renovated in their entirety under the scope of this project option.

The electrical systems will include work associated with power, generator power, lighting, lighting controls, intercom/public address systems. Power provisions will be provided for classroom technology, data, voice, building security (door access control, intrusion detection, video surveillance), and food service. The electrical systems, in concert with the architectural, mechanical, communications, electronic safety and security, and food service considerations, are intended to create spaces that are flexible, functional, energy-efficient and respond to the needs of this facility.

The electrical design will comply with applicable codes, regulations, standards, and authorities having jurisdiction. Sustainable technologies will be incorporated into the design to meet requirements of the Maryland Green Building Council - High-Performance Green Building Program, which requires compliance with either USGBC LEED v4 (minimum LEED Silver certification), GBI Green Globes (minimum two Green Globes), or Maryland Green Building Council-adopted version of International Green Construction Code (IgCC).

Electrical Service

A new outdoor Pepco utility transformer will be provided near the new main electrical room. Montgomery County Public School (MCPS) prefers pad-mounted utility transformers over the existing utility transformer vault, therefore, a pad-mounted utility transformer option will be explored with PEPCO. A secondary service concrete-encased ductbank (with minimum 10 ducts) will be run from the utility transformer to the CT section of the new main switchboard in the new main electrical room.

A separate utility service, with separate billing, will be explored during design to allow the pool area to function independently of the rest of the school building.

Power Distribution

The new main electrical room will consist of the new main switchboard, dry-type transformer(s), distribution panelboard, lighting panelboard, and branch circuit panelboards.

A separate "auxiliary" electrical room will be provided within the new main electrical room for new generator-connected equipment. Generator-connected equipment will consist of enclosed switches, automatic transfer switches, dry-type transformers, and panelboards.

The new main switchboard will be connected to Pepco utility power, will be rated at 2,000 amperes, 277/480 volts, 3-phase, 4-wire, will incorporate ground fault protection and surge protection, and will have a CT section, a tap section for connection of future on-site photovoltaic (PV) system, main section with 2,000-ampere main circuit breaker, and distribution section(s) with molded-case feeder circuit breakers. The main switchboard will serve mechanical loads and panelboards, lighting panelboards, and general receptacle branch circuit panelboards (via step-down transformers) in the main electrical room and electrical closets throughout the school. The main switchboard will be sized with spare capacity and space for future circuit breakers in order to accommodate any future renovations to the school.

The Maryland Emergency Management Agency (MEMA) may designate Piney Branch ES as an emergency public shelter. Electrical equipment for the MEMA emergency public shelter will include a 3,000-ampere outdoor generator docking station or outdoor quick-connect generator switchboard, with multiple cam-lock connectors per phase, in order to connect a temporary portable generator to the main switchboard. An additional main section with 2,000A main circuit breaker will be required at the main switchboard and connected to the outdoor generator docking station or outdoor quick-connect generator switchboard. The main circuit breakers of the switchboard will be key-interlocked so that only one main circuit breaker can be "closed" at a time to prevent simultaneous closure. The gymnasium / multi-purpose room, cafetorium / multi-purpose room, food service, and corridors connecting these spaces will be designated by MEMA to be used as an emergency public shelter, with the electrical loads and mechanical equipment supporting these spaces to be operational when connected to a temporary portable generator. MCPS may request MEMA for a waiver to not designate Piney Branch ES as an emergency public shelter.

Panelboards will be rated at 277/480 volts and 120/208 volts and serve as distribution, lighting, or branch circuit panels. There will be dedicated panelboards for lighting, mechanical loads, and receptacle plug loads. Panelboards will have a copper bus structure. Panelboards will be sized with approximately 25 percent spare capacity and 25 percent spare breaker space. A three-phase surge protective device (SPD) will be mounted adjacent to each respective emergency (life-safety) panel, lighting panel, and receptacle / plug load branch circuit panel. Panelboard circuit directories will be typed. 120/208-volt panelboards will be located such that branch circuit wiring is not run over 150 feet, to avoid long distances and increased wire sizes due to voltage drop.

The typical dry-type transformer will be general-purpose, energy-efficient type, complying with DOE 2016, and will have a 480-volt delta primary, and 208/120-volt, three-phase, four-wire, wye secondary.

Lighting will be connected at 277 volts, single-phase. Mechanical equipment will be connected at either 120 volts, single-phase; 208 volts, single-phase; 208 volts, 3-phase; 277 volts, single-phase; or 480 volts, 3 phase, depending upon the load requirements. Motors one horsepower or larger will be connected at 480 volts, 3-phase. General receptacles will be connected at 120 volts, single-phase. Each feeder and branch circuit will have a separate copper grounding conductor in the same raceway.

Rigid galvanized steel (RGS) conduit will be used in the first five feet of underground conduit extending outside of the building, under roads and paved areas where existing pavement is not to be disturbed, and for elbows penetrating floor slabs, exterior walls, or bearing walls. Intermediate metal conduit (IMC) will be used for wiring to exterior equipment. Electrical metallic tubing (EMT) will be used in interior spaces, except where RGS is required. Polyvinylchloride (PVC) conduit will be used for underground feeders and circuits, except where RGS is required. Flexible metal conduit (FMC) will be used to connect to transformers. Liquid-tight flexible metal conduit (LFMC) will be used to connect to motors and other vibrating equipment. FMC and LFMC will be limited to a maximum 6-foot length. The minimum size conduit will be 3/4 inches.

The wiring system will be copper conductors with THHN/THWN-2 insulation. MCPS allows the use of aluminum feeders for feeders 100 amperes (#2 AWG) and larger. For branch circuit wiring, Type MC cable will be allowed to be installed in concealed ceiling spaces, drywall partitions, and casework within instructional spaces. EMT conduit will be used in rooms with open ceilings, in masonry partitions, and masonry walls.

Receptacle branch circuits will utilize #12 wiring when the run is 50 linear feet or less, #10 wiring when the run is more between 50 and 100 linear feet, and #8 wiring when the run is over 100 linear feet.

Tamper-resistant receptacles will be provided throughout to meet NEC requirements for educational facilities. Convenience receptacles will be provided throughout, including multiple locations within classrooms, including at teacher's desk, teacher's wardrobe, and "computer cart" charging station. Receptacle device plates will be labeled with circuit designations. Overhead cord reels with receptacle connections may be provided in technology education spaces.

Switched / controlled receptacles will be provided to meet the IECC requirement that at least 50% of 120-volt 20-ampere receptacles in classrooms, private offices, conference rooms, work rooms, and staff break room. Switched / controlled receptacles will be connected to the lighting controls system and controlled by occupancy sensor(s) in respective room.

Electrical provisions will be made for electric vehicle (EV) charging stations in the parking lot.

Solar Photovoltaic

Electrical provisions will be made for a future solar photovoltaic (PV) system in order for the school to be solar PV ready. These provisions will include a dedicated tap section for PV system connection at the main switchboard and underground raceways for PV canopies. Raceways for PV system components located on the roof will be provided by the PV System Installer.

Generator Power

There will be an onsite outdoor natural-gas generator with weatherproof, sound-attenuated enclosure, sized to accommodate emergency / life-safety and standby loads via automatic transfer switches. The generator will be rated at 277/480 volts, 3-phase, 4-wire. The estimated size for the generator is 150 kW. The basis-of-design generator manufacturer will be Rehlko (formerly Kohler) Power Systems.

Enclosed circuit breakers mounted at the generator will serve automatic transfer switches located in the "auxiliary" electrical room within the main electrical room. The first automatic transfer switch (ATS) will be for emergency / life safety loads and will connect to emergency panelboard(s). Emergency panelboard(s) will provide power to emergency egress lighting in corridors and instructional spaces, and exit signs. The second ATS will be the "standby" ATS and will connect to standby panelboards.

Standby panelboards will serve data/voice communications equipment in telecom rooms, automatic temperature control (ATC) / building management system control panels, kitchen cooler/freezer, refrigerator in health suite, intercom/public address equipment, security equipment, fire detection and alarm equipment, heaters/heat trace for rooftop equipment and outdoor piping, elevator cab, sump pumps, and other equipment and devices as determined by MCPS. The "standby" ATS will also serve selected receptacles in the principal's office, main office, health suite, corridors, gymnasium, cafeteria, kitchen, and classrooms.

Article 700 Emergency Systems, Section 700.3(F) of the NEC requires a generator docking station to be provided on the emergency / life-safety power distribution system to allow for connecting to a temporary portable generator when the permanent on-site generator needs maintenance or repair. The generator docking station will be connected between the emergency output circuit breaker of the on-site generator and the emergency automatic transfer switch. The generator docking station will have provisions to connect to a load bank via cam lock connectors. The generator docking station will be sized to accommodate the entire generator load and will be located at the building exterior adjacent to the generator.

Overcurrent devices are required by the NEC to be "selectively coordinated" from the generator down to the branch circuit overcurrent devices on the emergency / life-safety panelboard(s). The NEC requires selective coordination on the "full range of overcurrent protective device opening times associated with those overcurrents". In order to meet this requirement, fuse-type panelboards will be utilized for emergency / life safety panelboards. Spare fuse cabinet with 25% spare fuses will be located next to fuse-type panelboards.

Lighting

Luminaires (lighting fixtures) will utilize LED light sources. LED luminaires in corridors, classrooms, instructional spaces, offices, workrooms, seminar rooms, storage rooms, group toilet rooms, and rooms with lay-in ceilings will be recessed 2' x 2' or 2' x 4' LED luminaires. Recessed LED downlights will be used where smaller luminaires are appropriate. High abuse wall-mounted LED luminaires will be used in stairwells. LED strip luminaires will be used in support spaces with open ceilings. High-bay "UFO" style luminaires will be provided in the gymnasium and pool. Architectural LED luminaires will be provided in the main vestibule, main lobby, media center, and cafetorium / multi-purpose room.

For specialty pendant-mounted lighting in high ceilings, remote drivers will not be located in high ceiling spaces. LED tunable white lighting fixtures will be provided in special education instructional spaces. Emergency lighting and exit signs with red lettering will be provided where required. Exit signs will be LED type.

Exterior full-cutoff dark-sky compliant LED building-mounted luminaires will be provided. Exterior luminaires will include building-mounted luminaires around the perimeter of the building, and pole-mounted luminaires for parking, drop-off, and bus loop. Luminaires will be located so as not to exceed the maximum lighting levels beyond the property line. The finish of exterior luminaires will be selected by the Architect.

The lighting design will comply with 2021 International Energy Conservation Code (IECC) and Maryland Green Building Council - High Performance Green Building Program. Lighting power density (LPD) will not exceed 0.61 watts per square foot, which is 15% better than 0.72 watts per square foot for a school building in the IECC. The selection of lighting fixtures for the building will be compliant with the energy code.

Lighting levels will be designed in accordance with the recommendations of the Illuminating Engineering Society (IES). Maintained illumination values will be calculated using a total maintenance factor of 90 percent. Classrooms will have an average between 30 and 50 foot-candles at the task plane. The lighting levels for the pool deck, water surface, and pool equipment room will be a minimum of 20-footcandles. The correlate color temperature (CCT) rating will be 3500 Kelvin for interior luminaires and 3000 Kelvin for exterior luminaires per MCPS requirements.

Lighting Controls

Switching of luminaires will have ON/OFF and RAISE/LOWER lighting level capability in regularly occupied spaces and will be zoned as appropriate for larger spaces. Occupancy sensors will be utilized for automatic control of both interior and exterior lighting. In addition, an astronomic time switch / time clock will be used to turn ON/OFF exterior lighting if needed.

Lighting controls in classrooms and instructional spaces will include a dedicated lighting load relay controller (to be located in accessible ceiling space near respective entrance/egress door), low-voltage lighting control stations, and ceiling occupancy sensor(s).

Luminaires in each classroom and instructional space will be on one zone controlled by local lighting control stations. The lighting control station located at each entrance/egress door will provide ON/OFF capability. The lighting control station located at the teacher station will provide ON/OFF and RAISE/LOWER lighting level capability. Luminaires will be turned-on at a 50% lighting level. Additional lighting control stations will be provided per MCPS requirements.

One luminaire in each classroom will also be connected to an emergency lighting circuit (via UL 924 relay or generator transfer device) and will be automatically switched ON during a power outage.

Occupancy sensors in classrooms, other instructional spaces, offices, workrooms, seminar rooms, and storage rooms will be set to "vacancy" mode, meaning that lighting in these spaces will need to be manually turned ON via local lighting control wall station. Occupancy sensors in group toilet rooms, individual toilet rooms, vestibules, corridors, and stairwells will be set to "occupancy" mode, meaning that lighting in these spaces will be automatically turned ON when occupied.

Automatic daylight controls (daylight photocell/sensor that automatically dims lighting when there is sufficient daylight in a space) for daylight harvesting will be utilized only where required per 2021 International Energy Conservation Code (IECC). Daylight harvesting will be required in rooms where there is more than 150 watts of general lighting within a sidelight or toplight daylight zones.

In compliance with 2021 NFPA 101 (Life Safety Code), Sections 7.8.1.2.2, 7.8.1.2.3 and A.7.8.1.2.3, where occupancy sensors are used to control lighting fixtures within the means of egress (corridors, stairs), lighting fixtures will automatically be illuminated to full output upon activation of the building fire alarm system.

In order to meet 2021 IECC, Section C405.2.7.3, for lighting setback, each exterior building-mounted luminaire will have an integral occupancy sensor to dim lighting to 50 percent lighting level when occupancy is not detected for 5 minutes.

Lightning Protection

Lightning protection will not be provided. Building systems will be protected from lightning-induced currents and transients by surge protective devices (SPD's) at the main switchboard, generator emergency / life-safety panelboards (per NEC), generator standby panelboards, lighting panelboards, and receptacle branch circuit panelboards. If the grounding system is installed and connected correctly (to ground ring, to building steel, to cold water pipes, and to structural footer), the SPD's will work properly to protect equipment.

Public Address System:

Intercommunications/public address system devices will include speakers and call switches. Stand-alone sound reinforcement systems will be provided in the multipurpose room, main gymnasium, auxiliary gym, dance rooms, and music rooms per MCPS standards.

Security System:

Security systems will include door access control (card readers), intrusion detection (keypads and motion detectors), and video surveillance (cameras). Distributed antenna system will be provided for public safety radio for first responders.

Technology Infrastructure:

The school will have communications (data and voice) systems including wireless access points throughout for Wi-Fi. Provisions for audio/visual systems for instructional technology will be provided.

OPTION 1b – RENOVATION CONCEPT (WITHOUT POOL)

MECHANICAL SYSTEMS

<u>General</u>

The proposed Option #1b – Renovation concept (without pool) retains the existing Piney Branch ES in its with the exception of the pool area. The existing pool space will be renovated and reprogrammed as the new multi-purpose room and kitchen area. The current multi-purpose room and kitchen area will be reprogramed as music and art classrooms. Existing spaces throughout the school will be renovated in their entirety under the scope of this project option. To support these renovations, the existing chilled water infrastructure, heating water infrastructure, and localized HVAC equipment will be replaced throughout the school.

The proposed mechanical, plumbing, and fire protection systems are identical to the systems proposed for Option 1a except the pool systems will not be provided.

ELECTRICAL SYSTEMS

<u>General</u>

The proposed Option #1b - Renewal and pool demolition concept retains the entire Piney Branch ES building area. The existing electrical distribution equipment, lighting fixtures, lighting controls, receptacles, voice/data system, public address system, and security system components will be demolished and replaced. A new main electrical room and auxiliary electrical room will be provided within the existing building foot print within the existing main mechanical space. Existing spaces within the school will be renovated in their entirety under the scope of this project option.

The electrical systems will include work associated with power, generator power, lighting, lighting controls, intercom/public address systems. Power provisions will be provided for classroom technology, data, voice, building security (door access control, intrusion detection, video surveillance), and food service. The electrical systems, in concert with the architectural, mechanical, communications, electronic safety and security, and food service considerations, are intended to create spaces that are flexible, functional, energy-efficient and respond to the needs of this facility.

The electrical design will comply with applicable codes, regulations, standards, and authorities having jurisdiction. Sustainable technologies will be incorporated into the design to meet requirements of the Maryland Green Building Council - High-Performance Green Building Program, which requires compliance with either USGBC LEED v4 (minimum LEED Silver certification), GBI Green Globes (minimum two Green Globes), or Maryland Green Building Council-adopted version of International Green Construction Code (IgCC).

<u>Electrical Service</u>

A new outdoor Pepco utility transformer will be provided near the new main electrical room. Montgomery County Public School (MCPS) prefers pad-mounted utility transformers over the existing utility transformer vault, therefore, a pad-mounted utility transformer option will be explored with PEPCO. A secondary service concrete-encased ductbank (with minimum 10 ducts) will be run from the utility transformer to the CT section of the new main switchboard in the new main electrical room.

<u>Power Distribution</u>

The new main electrical room will consist of the new main switchboard, dry-type transformer(s), distribution panelboard, lighting panelboard, and branch circuit panelboards.

A separate "auxiliary" electrical room will be provided within the new main electrical room for new generator-connected equipment. Generator-connected equipment will consist of enclosed switches, automatic transfer switches, dry-type transformers, and panelboards.

The new main switchboard will be connected to Pepco utility power, will be rated at 2,000 amperes, 277/480 volts, 3-phase, 4-wire, will incorporate ground fault protection and surge protection, and will have a CT section, a tap section for connection of future on-site photovoltaic (PV) system, main section with 2,000-ampere main circuit breaker, and distribution section(s) with molded-case feeder circuit breakers. The main switchboard will serve mechanical loads and panelboards, lighting panelboards, and general receptacle branch circuit panelboards (via step-down transformers) in the main electrical room and electrical closets throughout the school. The main switchboard will be sized with spare capacity and space for future circuit breakers in order to accommodate any future renovations to the school.

The Maryland Emergency Management Agency (MEMA) may designate Piney Branch ES as an emergency public shelter. Electrical equipment for the MEMA emergency public shelter will include a 3,000-ampere outdoor generator docking station or outdoor quick-connect generator switchboard, with multiple cam-lock connectors per phase, in order to connect a temporary portable generator to the main switchboard. An additional main section with 3,000A main circuit breaker will be required at the main switchboard and connected to the outdoor generator docking station or outdoor quick-connect generator switchboard. The main circuit breakers of the switchboard will be key-interlocked so that only one main circuit breaker can be "closed" at a time to prevent simultaneous closure. The gymnasium / multi-purpose room, cafetorium / multi-purpose room, food service, and corridors connecting these spaces will be designated by MEMA to be used as an emergency public shelter, with the electrical loads and mechanical equipment supporting these spaces to be operational when connected to a temporary portable generator. MCPS may request MEMA for a waiver to not designate Piney Branch ES as an emergency public shelter.

Panelboards will be rated at 277/480 volts and 120/208 volts and serve as distribution, lighting, or branch circuit panels. There will be dedicated panelboards for lighting, mechanical loads, and receptacle plug loads. Panelboards will have a copper bus structure. Panelboards will be sized with approximately 25 percent spare capacity and 25 percent spare breaker space. A three-phase surge protective device (SPD) will be mounted adjacent to each respective emergency (life-safety) panel, lighting panel, and receptacle / plug load branch circuit panel. Panelboard circuit directories will be typed. 120/208-volt panelboards will be located such that branch circuit wiring is not run over 150 feet, to avoid long distances and increased wire sizes due to voltage drop.

The typical dry-type transformer will be general-purpose, energy-efficient type, complying with DOE 2016, and will have a 480-volt delta primary, and 208/120-volt, three-phase, four-wire, wye secondary.

Lighting will be connected at 277 volts, single-phase. Mechanical equipment will be connected at either 120 volts, single-phase; 208 volts, single-phase; 208 volts, 3-phase; 277 volts, single-phase; or 480 volts, 3 phase, depending upon the load requirements. Motors one horsepower or larger will be connected at 480 volts, 3-phase. General receptacles will be connected at 120 volts, single-phase. Each feeder and branch circuit will have a separate copper grounding conductor in the same raceway.

Rigid galvanized steel (RGS) conduit will be used in the first five feet of underground conduit extending outside of the building, under roads and paved areas where existing pavement is not to be disturbed, and for elbows penetrating floor slabs, exterior walls, or bearing walls. Intermediate metal conduit (IMC) will be used for wiring to exterior equipment. Electrical metallic tubing (EMT) will be used in interior spaces, except where RGS is required. Polyvinylchloride (PVC) conduit will be used for underground feeders and circuits, except where RGS is required. Flexible metal conduit (FMC) will be used to connect to transformers. Liquid-tight flexible metal conduit (LFMC) will be used to connect to motors and other vibrating equipment. FMC and LFMC will be limited to a maximum 6-foot length. The minimum size conduit will be 3/4 inches.

The wiring system will be copper conductors with THHN/THWN-2 insulation. MCPS allows the use of aluminum feeders for feeders 100 amperes (#2 AWG) and larger. For branch circuit wiring, Type MC cable will be allowed to be installed in concealed ceiling spaces, drywall partitions, and casework within instructional spaces. EMT conduit will be used in rooms with open ceilings, in masonry partitions, and masonry walls.

Receptacle branch circuits will utilize #12 wiring when the run is 50 linear feet or less, #10 wiring when the run is more between 50 and 100 linear feet, and #8 wiring when the run is over 100 linear feet.

Tamper-resistant receptacles will be provided throughout to meet NEC requirements for educational facilities. Convenience receptacles will be provided throughout, including multiple locations within classrooms, including at teacher's desk, teacher's wardrobe, and "computer cart" charging station. Receptacle device plates will be labeled with circuit designations. Overhead cord reels with receptacle connections may be provided in technology education spaces.

Switched / controlled receptacles will be provided to meet the IECC requirement that at least 50% of 120-volt 20-ampere receptacles in classrooms, private offices, conference rooms, work rooms, and staff break room. Switched / controlled receptacles will be connected to the lighting controls system and controlled by occupancy sensor(s) in respective room.

Electrical provisions will be made for electric vehicle (EV) charging stations in the parking lot.

Solar Photovoltaic

Electrical provisions will be made for a future solar photovoltaic (PV) system in order for the school to be solar PV ready. These provisions will include a dedicated tap section for PV system connection at the main switchboard and underground raceways for PV canopies. Raceways for PV system components located on the roof will be provided by the PV System Installer.

Generator Power

There will be an onsite outdoor natural-gas generator with weatherproof, sound-attenuated enclosure, sized to accommodate emergency / life-safety and standby loads via automatic transfer switches. The generator will be rated at 277/480 volts, 3-phase, 4-wire. The estimated size for the generator is 150 kW. The basis-of-design generator manufacturer will be Rehlko (formerly Kohler) Power Systems.

Enclosed circuit breakers mounted at the generator will serve automatic transfer switches located in the "auxiliary" electrical room within the main electrical room. The first automatic transfer switch (ATS) will be for emergency / life safety loads and will connect to emergency panelboard(s). Emergency panelboard(s) will provide power to emergency egress lighting in corridors and instructional spaces, and exit signs. The second ATS will be the "standby" ATS and will connect to standby panelboards.

Standby panelboards will serve data/voice communications equipment in telecom rooms, automatic temperature control (ATC) / building management system control panels, kitchen cooler/freezer, refrigerator in health suite, intercom/public address equipment, security equipment, fire detection and alarm equipment, heaters/heat trace for rooftop equipment and outdoor piping, elevator cab, sump pumps, and other equipment and devices as determined by MCPS. The "standby" ATS will also serve selected receptacles in the principal's office, main office, health suite, corridors, gymnasium, cafeteria, kitchen, and classrooms.

Article 700 Emergency Systems, Section 700.3(F) of the NEC requires a generator docking station to be provided on the emergency / life-safety power distribution system to allow for connecting to a temporary portable generator when the permanent on-site generator needs maintenance or repair. The generator docking station will be connected between the emergency output circuit breaker of the on-site generator and the emergency automatic transfer switch. The generator docking station will have provisions to connect to a load bank via cam lock connectors. The generator docking station will be sized to

accommodate the entire generator load and will be located at the building exterior adjacent to the generator.

Overcurrent devices are required by the NEC to be "selectively coordinated" from the generator down to the branch circuit overcurrent devices on the emergency / life-safety panelboard(s). The NEC requires selective coordination on the "full range of overcurrent protective device opening times associated with those overcurrents". In order to meet this requirement, fuse-type panelboards will be utilized for emergency / life safety panelboards. Spare fuse cabinet with 25% spare fuses will be located next to fuse-type panelboards.

Lighting

Luminaires (lighting fixtures) will utilize LED light sources. LED luminaires in corridors, classrooms, instructional spaces, offices, workrooms, seminar rooms, storage rooms, group toilet rooms, and rooms with lay-in ceilings will be recessed 2' x 2' or 2' x 4' LED luminaires. Recessed LED downlights will be used where smaller luminaires are appropriate. High abuse wall-mounted LED luminaires will be used in stairwells. LED strip luminaires will be used in support spaces with open ceilings. High-bay "UFO" style luminaires will be provided in the gymnasium. Architectural LED luminaires will be provided in the main vestibule, main lobby, media center, and cafetorium / multi-purpose room.

For specialty pendant-mounted lighting in high ceilings, remote drivers will not be located in high ceiling spaces. LED tunable white lighting fixtures will be provided in special education instructional spaces. Emergency lighting and exit signs with red lettering will be provided where required. Exit signs will be LED type.

Exterior full-cutoff dark-sky compliant LED building-mounted luminaires will be provided. Exterior luminaires will include building-mounted luminaires around the perimeter of the building, and pole-mounted luminaires for parking, drop-off, and bus loop. Luminaires will be located so as not to exceed the maximum lighting levels beyond the property line. The finish of exterior luminaires will be selected by the Architect.

The lighting design will comply with 2021 International Energy Conservation Code (IECC) and Maryland Green Building Council - High Performance Green Building Program. Lighting power density (LPD) will not exceed 0.61 watts per square foot, which is 15% better than 0.72 watts per square foot for a school building in the IECC. The selection of lighting fixtures for the building will be compliant with the energy code.

Lighting levels will be designed in accordance with the recommendations of the Illuminating Engineering Society (IES). Maintained illumination values will be calculated using a total maintenance factor of 90 percent. Classrooms will have an average between 30 and 50 foot-candles at the task plane. The correlate color temperature (CCT) rating will be 3500 Kelvin for interior luminaires and 3000 Kelvin for exterior luminaires per MCPS requirements.

Lighting Controls

Switching of luminaires will have ON/OFF and RAISE/LOWER lighting level capability in regularly occupied spaces and will be zoned as appropriate for larger spaces. Occupancy sensors will be utilized for automatic control of both interior and exterior lighting. In addition, an astronomic time switch / time clock will be used to turn ON/OFF exterior lighting if needed.

Lighting controls in classrooms and instructional spaces will include a dedicated lighting load relay controller (to be located in accessible ceiling space near respective entrance/egress door), low-voltage lighting control stations, and ceiling occupancy sensor(s).

Luminaires in each classroom and instructional space will be on one zone controlled by local lighting control stations. The lighting control station located at each entrance/egress door will provide ON/OFF

capability. The lighting control station located at the teacher station will provide ON/OFF and RAISE/LOWER lighting level capability. Luminaires will be turned-on at a 50% lighting level. Additional lighting control stations will be provided per MCPS requirements.

One luminaire in each classroom will also be connected to an emergency lighting circuit (via UL 924 relay or generator transfer device) and will be automatically switched ON during a power outage.

Occupancy sensors in classrooms, other instructional spaces, offices, workrooms, seminar rooms, and storage rooms will be set to "vacancy" mode, meaning that lighting in these spaces will need to be manually turned ON via local lighting control wall station. Occupancy sensors in group toilet rooms, individual toilet rooms, vestibules, corridors, and stairwells will be set to "occupancy" mode, meaning that lighting in these spaces will be automatically turned ON when occupied.

Automatic daylight controls (daylight photocell/sensor that automatically dims lighting when there is sufficient daylight in a space) for daylight harvesting will be utilized only where required per 2021 International Energy Conservation Code (IECC). Daylight harvesting will be required in rooms where there is more than 150 watts of general lighting within a sidelight or toplight daylight zones.

In compliance with 2021 NFPA 101 (Life Safety Code), Sections 7.8.1.2.2, 7.8.1.2.3 and A.7.8.1.2.3, where occupancy sensors are used to control lighting fixtures within the means of egress (corridors, stairs), lighting fixtures will automatically be illuminated to full output upon activation of the building fire alarm system.

In order to meet 2021 IECC, Section C405.2.7.3, for lighting setback, each exterior building-mounted luminaire will have an integral occupancy sensor to dim lighting to 50 percent lighting level when occupancy is not detected for 5 minutes.

<u>Lightning Protection</u>

Lightning protection will not be provided. Building systems will be protected from lightning-induced currents and transients by surge protective devices (SPD's) at the main switchboard, generator emergency / life-safety panelboards (per NEC), generator standby panelboards, lighting panelboards, and receptacle branch circuit panelboards. If the grounding system is installed and connected correctly (to ground ring, to building steel, to cold water pipes, and to structural footer), the SPD's will work properly to protect equipment.

<u>Public Address System:</u>

Intercommunications/public address system devices will include speakers and call switches. Stand-alone sound reinforcement systems will be provided in the multipurpose room, main gymnasium, auxiliary gym, dance rooms, and music rooms per MCPS standards.

<u>Security System:</u>

Security systems will include door access control (card readers), intrusion detection (keypads and motion detectors), and video surveillance (cameras). Distributed antenna system will be provided for public safety radio for first responders.

<u>Technology Infrastructure:</u>

The school will have communications (data and voice) systems including wireless access points throughout for Wi-Fi. Provisions for audio/visual systems for instructional technology will be provided.

OPTION 2a –RENOVATION + ADDITION CONCEPT (WITH POOL)

MECHANICAL SYSTEMS

General

Project Option 2a - Renovation and Addition (with pool) – demolishes less than 50% of the existing school, while providing multi-story building additions on the southeast and southwest sides of the building and comprehensive renovations throughout the existing school. The existing mechanical, plumbing, and fire protection systems will be replaced throughout the school under this option. Construction will be accomplished by temporarily relocating teachers and students to another school during construction.

The following mechanical system is recommended to support the proposed renovation and addition concept. This mechanical system provides a high level of overall energy efficiency and good thermal comfort for building occupants.

Heating and Cooling Infrastructure Systems

A centralized air-to-water heat pump unit system is recommended to support the proposed renovation and addition concept. This type of mechanical system provides the ability to have independent heating or cooling year-round, while delivering an extremely high level of overall building energy efficiency.

> Chilled/Heating Water Side of Heat Exchanger: A pair of air-to-water, two-pipe, heat pump chillers will generate either heating water or chilled water for the centralized air-to-water heat pump system. These heat pump chillers will be located on the roof, within the existing cooling tower enclosure, and positioned adjacent to the penthouse mechanical room. Three base-mounted chilled/heating water pumps (two active and one stand-by) will circulate a propylene glycol-water mixture between the heat pump chillers and the primary (source) side of the system's plate-and-frame heat exchanger. The heat exchanger and the chilled/heating water pumping systems will be located within the first floor mechanical room. Chilled/heating water pumps will be provided with N+1 redundancy such that the operation of the building can be maintained in the event of a single pump failure. In addition, these pumping systems will be equipped with variable frequency drives for use during system balancing. Major chilled/heating water infrastructure components, including the chilled/heating water pumps, a plate-and-frame heat exchanger, a glycol feeder, an air separator, an expansion tank, and a buffer tank will also be located within the first floor mechanical room.
>
> Heat Pump Loop Side of Heat Exchanger: Two base-mounted heat pump loop distribution pumps (one active and one stand-by) will circulate an all-water fluid between the secondary (load) side of the plate-and-frame heat exchanger and the water-source heat pump units located throughout the building. Heat pump loop distribution pumping systems will also be located within the first floor mechanical room and be provided with N+1 redundancy such that the operation of the building can be maintained in the event of a single pump failure. In addition, these pumping systems will be equipped with variable frequency drives for reduced energy consumption during periods of reduced system demand. Major heat pump loop infrastructure components, including the heat pump loop distribution pumps, a plate-and-frame heat exchanger (described previously), an air separator, and an expansion tank will also be located within the first floor mechanical room.

General Classroom HVAC Systems

Extended range vertical heat pump units will be provided for space conditioning within the general classroom areas, with these units located within mechanical closets positioned near the area served. Doors for all mechanical closets will be accessed from the corridor for routine maintenance. Heat pump units will generally be equipped with two-stage type compressors, helping to extend compressor life and improve the overall energy efficiency of these systems under part load operation.

A series of indoor DOAS units with supply and exhaust fans, enthalpy wheels for pre-conditioning outdoor air, DX heat pump coils with water-cooled compressors, and hot gas reheat coils for tempering supply air will be provided to deliver conditioned ventilation airflow to the classroom areas served. DOAS units will be installed on 4-inch concrete pads in the penthouse mechanical room. Airflow supplied from these DOAS units will be dehumidified, conditioned, and delivered to each space directly. Exhaust airflow from classrooms, restrooms, and storage room areas will be routed through each DOAS unit's enthalpy wheel for pre-conditioning of outdoor air.

The use of demand control ventilation within the classroom areas will be provided to assist with reducing the school's overall energy consumption. To accomplish this control strategy, a series of VAV retrofit-type air terminal units will be installed within the conditioned outdoor air ductwork systems. Each classroom will be provided with a dedicated VAV air terminal unit, regulating the quantity of conditioned outdoor air delivered to each space based on the actual room carbon dioxide levels.

Music and Art Classroom HVAC Systems

The music and art classroom areas will be provided with a similar HVAC system approach as the general classroom areas. This HVAC system approach includes extended range vertical heat pump units for space conditioning, DOAS units for ventilation, and demand control ventilation via VAV retrofit-type air terminal units. Heat pump units will continue to be positioned within mechanical closets, with supply and return air ductwork extending from these units to the area served.

Administration, Guidance, and Health Suite HVAC Systems

The administration, guidance, and administrative support areas will be provided with space conditioning through a dedicated variable refrigerant flow (VRF) system. This system will be complete with heat recovery type water-cooled condensing units connected to the heat pump loop. Condensing units will be located within mechanical rooms near the spaces served. Doors to mechanical rooms will be accessible from the corridor for routine maintenance.

The use of ceiling cassette type VRF terminal units is anticipated, promoting sufficient clearance access for filter replacement. Multi-occupant spaces will be provided with 3'x3' cassettes with high efficiency (MERV 10 or higher) disposable filters. Single occupant spaces will be provided with 2'x2' cassettes with the VRF manufacturer's standard washable filter.

A dedicated DOAS unit with supply and exhaust fans, an enthalpy wheel for pre-conditioning outdoor air, a hot gas reheat coil for tempering supply air, and a DX heat pump coil with water-cooled compressors will be provided to deliver conditioned ventilation airflow to the administration areas served. The DOAS unit will be installed on a 4-inch concrete pad in the penthouse mechanical room. Airflow supplied from this DOAS unit will be dehumidified, conditioned, and delivered directly to each space. Exhaust airflow from the offices, restrooms, and storage room areas will be routed through the DOAS unit's enthalpy wheel for pre-conditioning of outdoor air.

Media Center HVAC System

An extended range large capacity vertical heat pump unit will be provided for space conditioning within the media center area. This heat pump unit will be similar to those provided for the school's general classroom areas; however, also provided with multiple compressors and hot-gas reheat to accomplish room level humidity control. This heat pump unit will be positioned with the penthouse mechanical room. Conditioned ventilation air for the media center will be provided by the classroom DOAS units described previously.

Gymnasium HVAC Systems

An indoor air handling unit with heat pump type water-cooled compressor, and hot gas reheat coil will provide space conditioning and ventilation for the gymnasium area. The water-cooled compressors will be connected to the heat pump loop. Full airside economizer and enthalpy wheel energy recovery devices will be provided where required by the International Energy Conservation Code. Demand control ventilation will be provided for the units serving the Gymnasium. This air handling unit will be positioned within a mechanical room located adjacent to the gymnasium space

Cafe/Multi-Purpose Room HVAC Systems

An indoor air handling unit with heat pump type water-cooled compressor, and hot gas reheat coil will provide space conditioning and ventilation for the cafe/multipurpose room. The water-cooled compressor will be connected to the heat pump loop. Full airside economizer and enthalpy wheel energy recovery devices will be provided where required by the International Energy Conservation Code. Demand control ventilation will be provided for the units serving the Cafe/Multipurpose Room. This air handling unit will be located within the penthouse mechanical room.

Kitchen HVAC Systems

An indoor air handling unit with heat pump type water-cooled compressor, and hot gas reheat coil will provide space conditioning and ventilation for the kitchen. The air handling unit will be located within the penthouse mechanical room and the water-cooled compressor will be connected to the heat pump loop. Full airside economizer and enthalpy wheel energy recovery devices will be provided where required by the International Energy Conservation Code. General exhaust from the kitchen restroom, storage rooms, and the kitchen space itself will be routed to a rooftop exhaust fan. A separate rooftop exhaust fan will also be provided for serving the kitchen's associated exhaust hood.

Pool Area HVAC Systems

Space conditioning and ventilation for the pool will be provided by a pair of indoor single-zone variable air volume, heat pump type, air-handling units. The heat pump units will be air-source with split condensing units located on the roof of the pool area. The air handling unit will be positioned inside the mechanical room adjacent to the pool area. Auxiliary heating will be provided by two new hydronic duct heating coils. Heating water will be generated by an air-source, heat pump type, water heater. A new inline pump, expansion tank, and air separator will be provided for the heating water system. A new heat exchanger and pool water pump will also be provided with a pool water circuit piped to the air handling units and heat exchanger for pool water heating.

Miscellaneous Building Areas

Data, Telecomm, and Elevator Room will be served by ductless split systems. Heating-only type spaces such as mechanical rooms, electrical rooms, stairs, storage rooms, and entry vestibules will be provided with electric cabinet and propeller unit heaters. In addition, a dedicated switch-operated exhaust fan will also be provided within the health suite area and within the administration workroom.

Building Automation Control System

Automatic temperature controls will be direct digital type controls (DDC). Actuation will be electric / electronic for all systems. All system components will be installed in accordance with MCPS standards and networked to the existing front-end server located at the MCPS Energy Management Office.

PLUMBING SYSTEMS

Domestic Water Piping Systems (Including Water Service Entrance)

A new combination fire/water service will enter the school within the first floor mechanical room. The new combination fire/water service will be capable of supporting both the fire and water service demands of the school. A new domestic water service, complete with basket strainer and backflow preventer will separate the domestic water and fire services prior to distributing water throughout the school. Domestic water piping will be distributed from this first floor mechanical room area to plumbing fixtures and equipment located throughout the school. The existing domestic water piping will be replaced throughout the entire school.

Domestic Hot Water Heater System

Domestic hot water for the proposed renovation and addition concept will be generated by a pair of electric resistance tank type domestic water heaters. Domestic hot water will be generated at 140-degrees F, with 120-degrees F domestic hot water distributed throughout the school. Local thermostatic mixing valves will reduce the water temperature to 110-degrees F at hand washing fixtures. The piping loop will be complete with a dedicated hot water circulation pump and expansion tank.

Storm Water Piping Systems

Storm water drainage, including roof drains, overflow drains, and storm water piping systems will be replaced to the greatest extent possible throughout the entire school. Above- and below-grade storm water piping will be constructed from PVC material. All storm water piping systems will exit the school at various locations and coordinate with available site piping connections provided for the proposed renovation and addition option.

Roof drains with interior storm water piping are anticipated for flat roof areas. Roof gutters with exterior downspouts are anticipated for sloped roof areas. Cast iron storm water leader shoes will be provided where downspouts transition to below grade storm water piping before connecting to the site storm water system.

Sanitary and Vent Piping Systems

Sanitary waste and vent piping systems will be replaced to the greatest extent possible throughout the entire school. Above- and below-grade sanitary and vent piping will be constructed from PVC material. Vent piping will terminate at the roof level, with a minimum 25-foot separation provided between vent piping terminations and any outdoor air intake locations. Sanitary piping systems will exit the building at various locations and will coordinate with the available site piping connections provided for the proposed renovation and addition option.

The following special sanitary and vent piping systems are anticipated:

- Equipment and sinks that may discharge grease into the sanitary system from the kitchen will be piped to a new underground concrete grease interceptor. The discharge from this interceptor will be connected to site sanitary piping system.
- Sinks within the art classrooms will be provided with solids interceptors, collecting debris and preventing it from entering the site sanitary piping system.

Plumbing Fixtures

The school's existing plumbing fixtures will be replaced under Option 2a. Institutional grade replacement plumbing fixtures will be provided that include floor-mounted water closets utilizing 1.28 gallon per flush valves, pint flush (0.125 gallon per flush) wall-hung urinals, and wall-hung lavatories with hot and cold water faucets with low flow aerators. The water consumption figures noted are equal to or less than what is required by the current plumbing code and for promoting good water conservation practices. All new plumbing fixtures will be ADA compliant.

Gas Piping Systems

The existing Piney Branch ES indoor natural gas service, associated meter, and interior gas piping will be replaced to accommodate the proposed renovation and addition scope of work. A new natural gas service will be provided by Washington Gas for the school. The gas service meter and pressure reducing station will be positioned outdoors and located near the main mechanical room. Gas piping will serve the emergency generator only.

FIRE PROTECTION SYSTEMS

Sprinkler System

The entire building will be fully sprinklered, with the sprinkler system separated into several zones that will match the fire alarm pull zones for the building. The existing sprinkler heads and associated branch sprinkler piping will be removed and replaced throughout the school, with new sprinkler piping extending from the new combination fire/water service entering the school within the first floor mechanical room.

A fire flow test will be performed during the early stages of design to confirm the available municipal water pressure and determine if a fire pump is required to support the proposed sprinkler system. A fire pump is not currently anticipated based on the available water pressure at the existing school. All work will be specified to conform to standards of the National Fire Protection Association (NFPA) and will include requirements for performance verification through hydraulic calculations.

Fire Detection and Alarm System

The existing fire detection and alarm system will be demolished and replaced throughout the entire building. The existing fire detection and alarm system has one-way voice communication function and may be reused.

The fire detection and alarm system will comply with State of Maryland Fire Code, local authorities having jurisdiction, International Building Code, and NFPA. The fire detection and alarm system will be a stand-alone, addressable, and will have voice evacuation capability. The main fire alarm control panel (FACP) will be located either in the main telecom room or in a location as directed by MCPS. The FACP will be equipped with battery backup. The fire alarm annunciator with graphic display and adjacent keypad will be located at the main building entrance vestibule or lobby.

Initiation devices include manual pull stations, smoke detectors, duct smoke detectors, heat detectors, and carbon monoxide detectors (where gas-fired equipment is used). Notification devices include fire alarm combination speaker/strobe devices, strobes, and fire alarm speakers. The fire detection and alarm system will be connected to the lighting control system to facilitate the automatic illumination of the path of egress upon initiation of the fire alarm system.

ELECTRICAL SYSTEMS

General

The proposed Option #2a – Full Renovation concept retains the entire Piney Branch ES building area with a full renovation of the existing floor levels and spaces. The existing electrical distribution equipment, lighting fixtures, lighting controls, receptacles, voice/data system, public address system, and security system components will be demolished and replaced. A new main electrical room and auxiliary electrical room will be provided within the existing building foot print within the existing main mechanical space. Existing spaces within the school will be renovated in their entirety under the scope of this project option.

The electrical systems will include work associated with power, generator power, lighting, lighting controls, intercom/public address systems. Power provisions will be provided for classroom technology, data, voice, building security (door access control, intrusion detection, video surveillance), and food service. The electrical systems, in concert with the architectural, mechanical, communications, electronic safety and security, and food service considerations, are intended to create spaces that are flexible, functional, energy-efficient and respond to the needs of this facility.

The electrical design will comply with applicable codes, regulations, standards, and authorities having jurisdiction. Sustainable technologies will be incorporated into the design to meet requirements of the Maryland Green Building Council - High-Performance Green Building Program, which requires compliance with either USGBC LEED v4 (minimum LEED Silver certification), GBI Green Globes (minimum two Green Globes), or Maryland Green Building Council-adopted version of International Green Construction Code (IgCC).

<u>Electrical Service</u>

A new outdoor Pepco utility transformer will be provided near the new main electrical room. Montgomery County Public School (MCPS) prefers pad-mounted utility transformers over the existing utility transformer vault, therefore, a pad-mounted utility transformer option will be explored with PEPCO. A secondary service concrete-encased ductbank (with minimum 10 ducts) will be run from the utility transformer to the CT section of the new main switchboard in the new main electrical room.

<u>Power Distribution</u>

The new main electrical room will consist of the new main switchboard, dry-type transformer(s), distribution panelboard, lighting panelboard, and branch circuit panelboards.

A separate "auxiliary" electrical room will be provided within the new main electrical room for new generator-connected equipment. Generator-connected equipment will consist of enclosed switches, automatic transfer switches, dry-type transformers, and panelboards.

The new main switchboard will be connected to Pepco utility power, will be rated at 2,000 amperes, 277/480 volts, 3-phase, 4-wire, will incorporate ground fault protection and surge protection, and will have a CT section, a tap section for connection of future on-site photovoltaic (PV) system, main section with 2,000-ampere main circuit breaker, and distribution section(s) with molded-case feeder circuit breakers. The main switchboard will serve mechanical loads and panelboards, lighting panelboards, and general receptacle branch circuit panelboards (via step-down transformers) in the main electrical room and electrical closets throughout the school. The main switchboard will be sized with spare capacity and space for future circuit breakers in order to accommodate any future renovations to the school.

The Maryland Emergency Management Agency (MEMA) may designate Piney Branch ES as an emergency public shelter. Electrical equipment for the MEMA emergency public shelter will include a 3,000-ampere outdoor generator docking station or outdoor quick-connect generator switchboard, with multiple cam-lock connectors per phase, in order to connect a temporary portable generator to the main switchboard. An additional main section with 3,000A main circuit breaker will be required at the main switchboard and connected to the outdoor generator docking station or outdoor quick-connect generator switchboard. The main circuit breakers of the switchboard will be key-interlocked so that only one main circuit breaker can be "closed" at a time to prevent simultaneous closure. The gymnasium / multi-purpose room, cafetorium / multi-purpose room, food service, and corridors connecting these spaces will be designated by MEMA to be used as an emergency public shelter, with the electrical loads and mechanical equipment supporting these spaces to be operational when connected to a temporary portable generator. MCPS may request MEMA for a waiver to not designate Piney Branch ES as an emergency public shelter.

Panelboards will be rated at 277/480 volts and 120/208 volts and serve as distribution, lighting, or branch circuit panels. There will be dedicated panelboards for lighting, mechanical loads, and receptacle plug loads. Panelboards will have a copper bus structure. Panelboards will be sized with approximately 25 percent spare capacity and 25 percent spare breaker space. A three-phase surge protective device (SPD) will be mounted adjacent to each respective emergency (life-safety) panel, lighting panel, and receptacle / plug load branch circuit panel. Panelboard circuit directories will be typed. 120/208-volt panelboards will be located such that branch circuit wiring is not run over 150 feet, to avoid long distances and increased wire sizes due to voltage drop.

The typical dry-type transformer will be general-purpose, energy-efficient type, complying with DOE 2016, and will have a 480-volt delta primary, and 208/120-volt, three-phase, four-wire, wye secondary.

Lighting will be connected at 277 volts, single-phase. Mechanical equipment will be connected at either 120 volts, single-phase; 208 volts, single-phase; 208 volts, 3-phase; 277 volts, single-phase; or 480 volts, 3 phase, depending upon the load requirements. Motors one horsepower or larger will be connected at 480 volts, 3-phase. General receptacles will be connected at 120 volts, single-phase. Each feeder and branch circuit will have a separate copper grounding conductor in the same raceway.

Rigid galvanized steel (RGS) conduit will be used in the first five feet of underground conduit extending outside of the building, under roads and paved areas where existing pavement is not to be disturbed, and for elbows penetrating floor slabs, exterior walls, or bearing walls. Intermediate metal conduit (IMC) will be used for wiring to exterior equipment. Electrical metallic tubing (EMT) will be used in interior spaces, except where RGS is required. Polyvinylchloride (PVC) conduit will be used for underground feeders and circuits, except where RGS is required. Flexible metal conduit (FMC) will be used to connect to transformers. Liquid-tight flexible metal conduit (LFMC) will be used to connect to motors and other vibrating equipment. FMC and LFMC will be limited to a maximum 6-foot length. The minimum size conduit will be 3/4 inches.

The wiring system will be copper conductors with THHN/THWN-2 insulation. MCPS allows the use of aluminum feeders for feeders 100 amperes (#2 AWG) and larger. For branch circuit wiring, Type MC cable will be allowed to be installed in concealed ceiling spaces, drywall partitions, and casework within instructional spaces. EMT conduit will be used in rooms with open ceilings, in masonry partitions, and masonry walls.

Receptacle branch circuits will utilize #12 wiring when the run is 50 linear feet or less, #10 wiring when the run is more between 50 and 100 linear feet, and #8 wiring when the run is over 100 linear feet.

Tamper-resistant receptacles will be provided throughout to meet NEC requirements for educational facilities. Convenience receptacles will be provided throughout, including multiple locations within classrooms, including at teacher's desk, teacher's wardrobe, and "computer cart" charging station. Receptacle device plates will be labeled with circuit designations. Overhead cord reels with receptacle connections may be provided in technology education spaces.

Switched / controlled receptacles will be provided to meet the IECC requirement that at least 50% of 120-volt 20-ampere receptacles in classrooms, private offices, conference rooms, work rooms, and staff break room. Switched / controlled receptacles will be connected to the lighting controls system and controlled by occupancy sensor(s) in respective room.

Electrical provisions will be made for electric vehicle (EV) charging stations in the parking lot.

<u>Solar Photovoltaic</u>

Electrical provisions will be made for a future solar photovoltaic (PV) system in order for the school to be solar PV ready. These provisions will include a dedicated tap section for PV system connection at the main switchboard and underground raceways for PV canopies. Raceways for PV system components located on the roof will be provided by the PV System Installer.

<u>Generator Power</u>

There will be an onsite outdoor natural-gas generator with weatherproof, sound-attenuated enclosure, sized to accommodate emergency / life-safety and standby loads via automatic transfer switches. The generator will be rated at 277/480 volts, 3-phase, 4-wire. The estimated size for the generator is 150 kW. The basis-of-design generator manufacturer will be Rehlko (formerly Kohler) Power Systems.

Enclosed circuit breakers mounted at the generator will serve automatic transfer switches located in the "auxiliary" electrical room within the main electrical room. The first automatic transfer switch (ATS) will be for emergency / life safety loads and will connect to emergency panelboard(s). Emergency panelboard(s) will provide power to emergency egress lighting in corridors and instructional spaces, and exit signs. The second ATS will be the "standby" ATS and will connect to standby panelboards.

Standby panelboards will serve data/voice communications equipment in telecom rooms, automatic temperature control (ATC) / building management system control panels, kitchen cooler/freezer, refrigerator in health suite, intercom/public address equipment, security equipment, fire detection and alarm equipment, heaters/heat trace for rooftop equipment and outdoor piping, elevator cab, sump pumps, and other equipment and devices as determined by MCPS. The "standby" ATS will also serve selected receptacles in the principal's office, main office, health suite, corridors, gymnasium, cafeteria, kitchen, and classrooms.

Article 700 Emergency Systems, Section 700.3(F) of the NEC requires a generator docking station to be provided on the emergency / life-safety power distribution system to allow for connecting to a temporary portable generator when the permanent on-site generator needs maintenance or repair. The generator docking station will be connected between the emergency output circuit breaker of the on-site generator and the emergency automatic transfer switch. The generator docking station will have provisions to connect to a load bank via cam lock connectors. The generator docking station will be sized to accommodate the entire generator load and will be located at the building exterior adjacent to the generator.

Overcurrent devices are required by the NEC to be "selectively coordinated" from the generator down to the branch circuit overcurrent devices on the emergency / life-safety panelboard(s). The NEC requires selective coordination on the "full range of overcurrent protective device opening times associated with those overcurrents". In order to meet this requirement, fuse-type panelboards will be utilized for emergency / life safety panelboards. Spare fuse cabinet with 25% spare fuses will be located next to fuse-type panelboards.

Lighting

Luminaires (lighting fixtures) will utilize LED light sources. LED luminaires in corridors, classrooms, instructional spaces, offices, workrooms, seminar rooms, storage rooms, group toilet rooms, and rooms with lay-in ceilings will be recessed 2' x 2' or 2' x 4' LED luminaires. Recessed LED downlights will be used where smaller luminaires are appropriate. High abuse wall-mounted LED luminaires will be used in stairwells. LED strip luminaires will be used in support spaces with open ceilings. High-bay "UFO" style luminaires will be provided in the gymnasium. Architectural LED luminaires will be provided in the main vestibule, main lobby, media center, and cafetorium / multi-purpose room.

For specialty pendant-mounted lighting in high ceilings, remote drivers will not be located in high ceiling spaces. LED tunable white lighting fixtures will be provided in special education instructional spaces. Emergency lighting and exit signs with red lettering will be provided where required. Exit signs will be LED type.

Exterior full-cutoff dark-sky compliant LED building-mounted luminaires will be provided. Exterior luminaires will include building-mounted luminaires around the perimeter of the building, and pole-mounted luminaires for parking, drop-off, and bus loop. Luminaires will be located so as not to exceed the maximum lighting levels beyond the property line. The finish of exterior luminaires will be selected by the Architect.

The lighting design will comply with 2021 International Energy Conservation Code (IECC) and Maryland Green Building Council - High Performance Green Building Program. Lighting power density (LPD) will not exceed 0.61 watts per square foot, which is 15% better than 0.72 watts per square foot for a school building in the IECC. The selection of lighting fixtures for the building will be compliant with the energy code.

Lighting levels will be designed in accordance with the recommendations of the Illuminating Engineering Society (IES). Maintained illumination values will be calculated using a total maintenance factor of 90 percent. Classrooms will have an average between 30 and 50 foot-candles at the task plane. The correlate color temperature (CCT) rating will be 3500 Kelvin for interior luminaires and 3000 Kelvin for exterior luminaires per MCPS requirements.

Lighting Controls

Switching of luminaires will have ON/OFF and RAISE/LOWER lighting level capability in regularly occupied spaces and will be zoned as appropriate for larger spaces. Occupancy sensors will be utilized for automatic control of both interior and exterior lighting. In addition, an astronomic time switch / time clock will be used to turn ON/OFF exterior lighting if needed.

Lighting controls in classrooms and instructional spaces will include a dedicated lighting load relay controller (to be located in accessible ceiling space near respective entrance/egress door), low-voltage lighting control stations, and ceiling occupancy sensor(s).

Luminaires in each classroom and instructional space will be on one zone controlled by local lighting control stations. The lighting control station located at each entrance/egress door will provide ON/OFF capability. The lighting control station located at the teacher station will provide ON/OFF and RAISE/LOWER lighting level capability. Luminaires will be turned-on at a 50% lighting level. Additional lighting control stations will be provided per MCPS requirements.

One luminaire in each classroom will also be connected to an emergency lighting circuit (via UL 924 relay or generator transfer device) and will be automatically switched ON during a power outage.

Occupancy sensors in classrooms, other instructional spaces, offices, workrooms, seminar rooms, and storage rooms will be set to "vacancy" mode, meaning that lighting in these spaces will need to be manually turned ON via local lighting control wall station. Occupancy sensors in group toilet rooms, individual toilet rooms, vestibules, corridors, and stairwells will be set to "occupancy" mode, meaning that lighting in these spaces will be automatically turned ON when occupied.

Automatic daylight controls (daylight photocell/sensor that automatically dims lighting when there is sufficient daylight in a space) for daylight harvesting will be utilized only where required per 2021 International Energy Conservation Code (IECC). Daylight harvesting will be required in rooms where there is more than 150 watts of general lighting within a sidelight or toplight daylight zones.

In compliance with 2021 NFPA 101 (Life Safety Code), Sections 7.8.1.2.2, 7.8.1.2.3 and A.7.8.1.2.3, where occupancy sensors are used to control lighting fixtures within the means of egress (corridors, stairs), lighting fixtures will automatically be illuminated to full output upon activation of the building fire alarm system.

In order to meet 2021 IECC, Section C405.2.7.3, for lighting setback, each exterior building-mounted luminaire will have an integral occupancy sensor to dim lighting to 50 percent lighting level when occupancy is not detected for 5 minutes.

Lightning Protection

Lightning protection will not be provided. Building systems will be protected from lightning-induced currents and transients by surge protective devices (SPD's) at the main switchboard, generator emergency / life-safety panelboards (per NEC), generator standby panelboards, lighting panelboards, and receptacle branch circuit panelboards. If the grounding system is installed and connected correctly (to ground ring, to building steel, to cold water pipes, and to structural footer), the SPD's will work properly to protect equipment.

Public Address System:

Intercommunications/public address system devices will include speakers and call switches. Stand-alone sound reinforcement systems will be provided in the multipurpose room, main gymnasium, auxiliary gym, dance rooms, and music rooms per MCPS standards.

Security System:

Security systems will include door access control (card readers), intrusion detection (keypads and motion detectors), and video surveillance (cameras). Distributed antenna system will be provided for public safety radio for first responders.

Technology Infrastructure:

The school will have communications (data and voice) systems including wireless access points throughout for Wi-Fi. Provisions for audio/visual systems for instructional technology will be provided.

OPTION 2b –RENOVATION + ADDITION CONCEPT (WITHOUT POOL)

MECHANICAL SYSTEMS

General

Project Option 2b - Renovation and Addition (without pool) – demolishes less than 50% of the existing school, with the exception of the pool area, while providing multi-story building additions on the southeast and southwest sides of the building and comprehensive renovations throughout the existing school. The existing pool space will be renovated and reprogrammed as the new multi-purpose room and kitchen area. The existing mechanical, plumbing, and fire protection systems will be replaced throughout the school under this option. Construction will be accomplished by temporarily relocating teachers and students to another school during construction.

The proposed mechanical, plumbing, and fire protection systems are identical to the systems proposed for Option 2a except the pool systems will not be provided.

ELECTRICAL SYSTEMS

General

The proposed Option #2b – Full Renovation and pool demolition concept retains the entire Piney Branch ES building area with a full renovation of the existing floor levels and spaces. The existing electrical distribution equipment, lighting fixtures, lighting controls, receptacles, voice/data system, public address system, and security system components will be demolished and replaced. A new main electrical room and auxiliary electrical room will be provided within the existing building foot print within the existing main mechanical space. Existing spaces within the school will be renovated in their entirety under the scope of this project option.

The electrical systems will include work associated with power, generator power, lighting, lighting controls, intercom/public address systems. Power provisions will be provided for classroom technology, data, voice, building security (door access control, intrusion detection, video surveillance), and food service. The electrical systems, in concert with the architectural, mechanical, communications, electronic safety and security, and food service considerations, are intended to create spaces that are flexible, functional, energy-efficient and respond to the needs of this facility.

The electrical design will comply with applicable codes, regulations, standards, and authorities having jurisdiction. Sustainable technologies will be incorporated into the design to meet requirements of the Maryland Green Building Council - High-Performance Green Building Program, which requires compliance with either USGBC LEED v4 (minimum LEED Silver certification), GBI Green Globes (minimum two Green Globes), or Maryland Green Building Council-adopted version of International Green Construction Code (IgCC).

Electrical Service

A new outdoor Pepco utility transformer will be provided near the new main electrical room. Montgomery County Public School (MCPS) prefers pad-mounted utility transformers over the existing utility transformer vault, therefore, a pad-mounted utility transformer option will be explored with PEPCO. A secondary service concrete-encased ductbank (with minimum 10 ducts) will be run from the utility transformer to the CT section of the new main switchboard in the new main electrical room.

Power Distribution

The new main electrical room will consist of the new main switchboard, dry-type transformer(s), distribution panelboard, lighting panelboard, and branch circuit panelboards.

A separate "auxiliary" electrical room will be provided within the new main electrical room for new generator-connected equipment. Generator-connected equipment will consist of enclosed switches, automatic transfer switches, dry-type transformers, and panelboards.

The new main switchboard will be connected to Pepco utility power, will be rated at 2,000 amperes, 277/480 volts, 3-phase, 4-wire, will incorporate ground fault protection and surge protection, and will have a CT section, a tap section for connection of future on-site photovoltaic (PV) system, main section with 2,000-ampere main circuit breaker, and distribution section(s) with molded-case feeder circuit breakers. The main switchboard will serve mechanical loads and panelboards, lighting panelboards, and general receptacle branch circuit panelboards (via step-down transformers) in the main electrical room and electrical closets throughout the school. The main switchboard will be sized with spare capacity and space for future circuit breakers in order to accommodate any future renovations to the school.

The Maryland Emergency Management Agency (MEMA) may designate Piney Branch ES as an emergency public shelter. Electrical equipment for the MEMA emergency public shelter will include a 3,000-ampere outdoor generator docking station or outdoor quick-connect generator switchboard, with multiple cam-lock connectors per phase, in order to connect a temporary portable generator to the main switchboard. An additional main section with 3,000A main circuit breaker will be required at the main switchboard and connected to the outdoor generator docking station or outdoor quick-connect generator switchboard. The main circuit breakers of the switchboard will be key-interlocked so that only one main circuit breaker can be "closed" at a time to prevent simultaneous closure. The gymnasium / multi-purpose room, cafetorium / multi-purpose room, food service, and corridors connecting these spaces will be designated by MEMA to be used as an emergency public shelter, with the electrical loads and mechanical equipment supporting these spaces to be operational when connected to a temporary portable generator. MCPS may request MEMA for a waiver to not designate Piney Branch ES as an emergency public shelter.

Panelboards will be rated at 277/480 volts and 120/208 volts and serve as distribution, lighting, or branch circuit panels. There will be dedicated panelboards for lighting, mechanical loads, and receptacle plug loads. Panelboards will have a copper bus structure. Panelboards will be sized with approximately 25 percent spare capacity and 25 percent spare breaker space. A three-phase surge protective device (SPD) will be mounted adjacent to each respective emergency (life-safety) panel, lighting panel, and receptacle / plug load branch circuit panel. Panelboard circuit directories will be typed. 120/208-volt panelboards will be located such that branch circuit wiring is not run over 150 feet, to avoid long distances and increased wire sizes due to voltage drop.

The typical dry-type transformer will be general-purpose, energy-efficient type, complying with DOE 2016, and will have a 480-volt delta primary, and 208/120-volt, three-phase, four-wire, wye secondary.

Lighting will be connected at 277 volts, single-phase. Mechanical equipment will be connected at either 120 volts, single-phase; 208 volts, single-phase; 208 volts, 3-phase; 277 volts, single-phase; or 480 volts, 3 phase, depending upon the load requirements. Motors one horsepower or larger will be connected at 480 volts, 3-phase. General receptacles will be connected at 120 volts, single-phase. Each feeder and branch circuit will have a separate copper grounding conductor in the same raceway.

Rigid galvanized steel (RGS) conduit will be used in the first five feet of underground conduit extending outside of the building, under roads and paved areas where existing pavement is not to be disturbed, and for elbows penetrating floor slabs, exterior walls, or bearing walls. Intermediate metal conduit (IMC) will be used for wiring to exterior equipment. Electrical metallic tubing (EMT) will be used in interior spaces, except where RGS is required. Polyvinylchloride (PVC) conduit will be used for underground feeders and circuits, except where RGS is required. Flexible metal conduit (FMC) will be used to connect to transformers. Liquid-tight flexible metal conduit (LFMC) will be used to connect to motors and other vibrating equipment. FMC and LFMC will be limited to a maximum 6-foot length. The minimum size conduit will be 3/4 inches.

The wiring system will be copper conductors with THHN/THWN-2 insulation. MCPS allows the use of aluminum feeders for feeders 100 amperes (#2 AWG) and larger. For branch circuit wiring, Type MC cable will be allowed to be installed in concealed ceiling spaces, drywall partitions, and casework within instructional spaces. EMT conduit will be used in rooms with open ceilings, in masonry partitions, and masonry walls.

Receptacle branch circuits will utilize #12 wiring when the run is 50 linear feet or less, #10 wiring when the run is more between 50 and 100 linear feet, and #8 wiring when the run is over 100 linear feet.

Tamper-resistant receptacles will be provided throughout to meet NEC requirements for educational facilities. Convenience receptacles will be provided throughout, including multiple locations within classrooms, including at teacher's desk, teacher's wardrobe, and "computer cart" charging station. Receptacle device plates will be labeled with circuit designations. Overhead cord reels with receptacle connections may be provided in technology education spaces.

Switched / controlled receptacles will be provided to meet the IECC requirement that at least 50% of 120-volt 20-ampere receptacles in classrooms, private offices, conference rooms, work rooms, and staff break room. Switched / controlled receptacles will be connected to the lighting controls system and controlled by occupancy sensor(s) in respective room.

Electrical provisions will be made for electric vehicle (EV) charging stations in the parking lot.

Solar Photovoltaic

Electrical provisions will be made for a future solar photovoltaic (PV) system in order for the school to be solar PV ready. These provisions will include a dedicated tap section for PV system connection at the main switchboard and underground raceways for PV canopies. Raceways for PV system components located on the roof will be provided by the PV System Installer.

Generator Power

There will be an onsite outdoor natural-gas generator with weatherproof, sound-attenuated enclosure, sized to accommodate emergency / life-safety and standby loads via automatic transfer switches. The generator will be rated at 277/480 volts, 3-phase, 4-wire. The estimated size for the generator is 150 kW. The basis-of-design generator manufacturer will be Rehlko (formerly Kohler) Power Systems.

Enclosed circuit breakers mounted at the generator will serve automatic transfer switches located in the "auxiliary" electrical room within the main electrical room. The first automatic transfer switch (ATS) will be for emergency / life safety loads and will connect to emergency panelboard(s). Emergency panelboard(s) will provide power to emergency egress lighting in corridors and instructional spaces, and exit signs. The second ATS will be the "standby" ATS and will connect to standby panelboards.

Standby panelboards will serve data/voice communications equipment in telecom rooms, automatic temperature control (ATC) / building management system control panels, kitchen cooler/freezer, refrigerator in health suite, intercom/public address equipment, security equipment, fire detection and alarm equipment, heaters/heat trace for rooftop equipment and outdoor piping, elevator cab, sump pumps, and other equipment and devices as determined by MCPS. The "standby" ATS will also serve selected receptacles in the principal's office, main office, health suite, corridors, gymnasium, cafeteria, kitchen, and classrooms.

Article 700 Emergency Systems, Section 700.3(F) of the NEC requires a generator docking station to be provided on the emergency / life-safety power distribution system to allow for connecting to a temporary portable generator when the permanent on-site generator needs maintenance or repair. The generator docking station will be connected between the emergency output circuit breaker of the on-site generator and the emergency automatic transfer switch. The generator docking station will have provisions to connect to a load bank via cam lock connectors. The generator docking station will be sized to

accommodate the entire generator load and will be located at the building exterior adjacent to the generator.

Overcurrent devices are required by the NEC to be "selectively coordinated" from the generator down to the branch circuit overcurrent devices on the emergency / life-safety panelboard(s). The NEC requires selective coordination on the "full range of overcurrent protective device opening times associated with those overcurrents". In order to meet this requirement, fuse-type panelboards will be utilized for emergency / life safety panelboards. Spare fuse cabinet with 25% spare fuses will be located next to fuse-type panelboards.

Lighting

Luminaires (lighting fixtures) will utilize LED light sources. LED luminaires in corridors, classrooms, instructional spaces, offices, workrooms, seminar rooms, storage rooms, group toilet rooms, and rooms with lay-in ceilings will be recessed 2' x 2' or 2' x 4' LED luminaires. Recessed LED downlights will be used where smaller luminaires are appropriate. High abuse wall-mounted LED luminaires will be used in stairwells. LED strip luminaires will be used in support spaces with open ceilings. High-bay "UFO" style luminaires will be provided in the gymnasium. Architectural LED luminaires will be provided in the main vestibule, main lobby, media center, and cafetorium / multi-purpose room.

For specialty pendant-mounted lighting in high ceilings, remote drivers will not be located in high ceiling spaces. LED tunable white lighting fixtures will be provided in special education instructional spaces. Emergency lighting and exit signs with red lettering will be provided where required. Exit signs will be LED type.

Exterior full-cutoff dark-sky compliant LED building-mounted luminaires will be provided. Exterior luminaires will include building-mounted luminaires around the perimeter of the building, and pole-mounted luminaires for parking, drop-off, and bus loop. Luminaires will be located so as not to exceed the maximum lighting levels beyond the property line. The finish of exterior luminaires will be selected by the Architect.

The lighting design will comply with 2021 International Energy Conservation Code (IECC) and Maryland Green Building Council - High Performance Green Building Program. Lighting power density (LPD) will not exceed 0.61 watts per square foot, which is 15% better than 0.72 watts per square foot for a school building in the IECC. The selection of lighting fixtures for the building will be compliant with the energy code.

Lighting levels will be designed in accordance with the recommendations of the Illuminating Engineering Society (IES). Maintained illumination values will be calculated using a total maintenance factor of 90 percent. Classrooms will have an average between 30 and 50 foot-candles at the task plane. The correlate color temperature (CCT) rating will be 3500 Kelvin for interior luminaires and 3000 Kelvin for exterior luminaires per MCPS requirements.

Lighting Controls

Switching of luminaires will have ON/OFF and RAISE/LOWER lighting level capability in regularly occupied spaces and will be zoned as appropriate for larger spaces. Occupancy sensors will be utilized for automatic control of both interior and exterior lighting. In addition, an astronomic time switch / time clock will be used to turn ON/OFF exterior lighting if needed.

Lighting controls in classrooms and instructional spaces will include a dedicated lighting load relay controller (to be located in accessible ceiling space near respective entrance/egress door), low-voltage lighting control stations, and ceiling occupancy sensor(s).

Luminaires in each classroom and instructional space will be on one zone controlled by local lighting control stations. The lighting control station located at each entrance/egress door will provide ON/OFF

capability. The lighting control station located at the teacher station will provide ON/OFF and RAISE/LOWER lighting level capability. Luminaires will be turned-on at a 50% lighting level. Additional lighting control stations will be provided per MCPS requirements.

One luminaire in each classroom will also be connected to an emergency lighting circuit (via UL 924 relay or generator transfer device) and will be automatically switched ON during a power outage.

Occupancy sensors in classrooms, other instructional spaces, offices, workrooms, seminar rooms, and storage rooms will be set to "vacancy" mode, meaning that lighting in these spaces will need to be manually turned ON via local lighting control wall station. Occupancy sensors in group toilet rooms, individual toilet rooms, vestibules, corridors, and stairwells will be set to "occupancy" mode, meaning that lighting in these spaces will be automatically turned ON when occupied.

Automatic daylight controls (daylight photocell/sensor that automatically dims lighting when there is sufficient daylight in a space) for daylight harvesting will be utilized only where required per 2021 International Energy Conservation Code (IECC). Daylight harvesting will be required in rooms where there is more than 150 watts of general lighting within a sidelight or toplight daylight zones.

In compliance with 2021 NFPA 101 (Life Safety Code), Sections 7.8.1.2.2, 7.8.1.2.3 and A.7.8.1.2.3, where occupancy sensors are used to control lighting fixtures within the means of egress (corridors, stairs), lighting fixtures will automatically be illuminated to full output upon activation of the building fire alarm system.

In order to meet 2021 IECC, Section C405.2.7.3, for lighting setback, each exterior building-mounted luminaire will have an integral occupancy sensor to dim lighting to 50 percent lighting level when occupancy is not detected for 5 minutes.

Lightning Protection

Lightning protection will not be provided. Building systems will be protected from lightning-induced currents and transients by surge protective devices (SPD's) at the main switchboard, generator emergency / life-safety panelboards (per NEC), generator standby panelboards, lighting panelboards, and receptacle branch circuit panelboards. If the grounding system is installed and connected correctly (to ground ring, to building steel, to cold water pipes, and to structural footer), the SPD's will work properly to protect equipment.

Public Address System:

Intercommunications/public address system devices will include speakers and call switches. Stand-alone sound reinforcement systems will be provided in the multipurpose room, main gymnasium, auxiliary gym, dance rooms, and music rooms per MCPS standards.

Security System:

Security systems will include door access control (card readers), intrusion detection (keypads and motion detectors), and video surveillance (cameras). Distributed antenna system will be provided for public safety radio for first responders.

Technology Infrastructure:

The school will have communications (data and voice) systems including wireless access points throughout for Wi-Fi. Provisions for audio/visual systems for instructional technology will be provided.

OPTION 3a - REPLACEMENT SCHOOL CONCEPT
MECHANICAL SYSTEMS

General

Project Option 3a - Renovation and Addition (with pool) – demolishes more than 50% of the existing school, while providing a multi-story building addition on the south side of the building and comprehensive renovations throughout the existing school. The existing mechanical, plumbing, and fire protection systems will be replaced throughout the school under this option. Construction will be accomplished by temporarily relocating teachers and students to another school during construction.

A geothermal heat pump system, with a the wellfield located under the parking lot area or the adjacent park area, will be investigated further during design. At this time a geothermal system does not appear feasible due to limited site area.

The following mechanical system is recommended to support the proposed renovation and addition concept. This mechanical system provides a high level of overall energy efficiency and good thermal comfort for building occupants.

Heating and Cooling Infrastructure Systems

A centralized air-to-water heat pump unit system is recommended to support the proposed renovation and addition concept. This type of mechanical system provides the ability to have independent heating or cooling year-round, while delivering an extremely high level of overall building energy efficiency.

Chilled/Heating Water Side of Heat Exchanger: A pair of air-to-water, two-pipe, heat pump chillers will generate either heating water or chilled water for the centralized air-to-water heat pump system. These heat pump chillers will be located on the roof, above the classroom wing corridor. Three base-mounted chilled/heating water pumps (two active and one stand-by) will circulate a propylene glycol-water mixture between the heat pump chillers and the primary (source) side of the system's plate-and-frame heat exchanger. The heat exchanger and the chilled/heating water pumping systems will be located within the first floor mechanical room. Chilled/heating water pumps will be provided with N+1 redundancy such that the operation of the building can be maintained in the event of a single pump failure. In addition, these pumping systems will be equipped with variable frequency drives for use during system balancing. Major chilled/heating water infrastructure components, including the chilled/heating water pumps, a plate-and-frame heat exchanger, a glycol feeder, an air separator, an expansion tank, and a buffer tank will also be located within the first floor mechanical room.

Heat Pump Loop Side of Heat Exchanger: Two base-mounted heat pump loop distribution pumps (one active and one stand-by) will circulate an all-water fluid between the secondary (load) side of the plate-and-frame heat exchanger and the water-source heat pump units located throughout the building. Heat pump loop distribution pumping systems will also be located within the first floor mechanical room and be provided with N+1 redundancy such that the operation of the building can be maintained in the event of a single pump failure. In addition, these pumping systems will be equipped with variable frequency drives for reduced energy consumption during periods of reduced system demand. Major heat pump loop infrastructure components, including the heat pump loop distribution pumps, a plate-and-frame heat exchanger (described previously), an air separator, and an expansion tank will also be located within the first floor mechanical room.

General Classroom HVAC Systems

Extended range vertical heat pump units will be provided for space conditioning within the general classroom areas, with these units located within mechanical closets positioned near the area served. Doors for all mechanical closets will be accessed from the corridor for routine maintenance. Heat pump units will generally be equipped with two-stage type compressors, helping to extend compressor life and improve the overall energy efficiency of these systems under part load operation.

A series of outdoor, roof mounted DOAS units with supply and exhaust fans, enthalpy wheels for pre-conditioning outdoor air, DX heat pump coils with water-cooled compressors, and hot gas reheat coils for tempering supply air will be provided to deliver conditioned ventilation airflow to the classroom areas served. DOAS units will be installed on roof curbs above the classroom wing corridor. The DOAS units will be located in the vicinity of the previously described heat pump chillers to maximize the area available to roof mounted photovoltaic systems. Airflow supplied from these DOAS units will be dehumidified, conditioned, and delivered to each space directly. Exhaust airflow from classrooms, restrooms, and storage room areas will be routed through each DOAS unit's enthalpy wheel for pre-conditioning of outdoor air.

The use of demand control ventilation within the classroom areas will be provided to assist with reducing the school's overall energy consumption. To accomplish this control strategy, a series of VAV retrofit-type air terminal units will be installed within the conditioned outdoor air ductwork systems. Each classroom will be provided with a dedicated VAV air terminal unit, regulating the quantity of conditioned outdoor air delivered to each space based on the actual room carbon dioxide levels.

Music and Art Classroom HVAC Systems

The music and art classroom areas will be provided with a similar HVAC system approach as the general classroom areas. This HVAC system approach includes extended range vertical heat pump units for space conditioning, DOAS units for ventilation, and demand control ventilation via VAV retrofit-type air terminal units. Heat pump units will continue to be positioned within mechanical closets, with supply and return air ductwork extending from these units to the area served.

Administration, Guidance, and Health Suite HVAC Systems

The administration, guidance, and administrative support areas will be provided with space conditioning through a dedicated variable refrigerant flow (VRF) system. This system will be complete with heat recovery type water-cooled condensing units connected to the heat pump loop. Condensing units will be located within mechanical rooms near the spaces served. Doors to mechanical rooms will be accessible from the corridor for routine maintenance.

The use of ceiling cassette type VRF terminal units is anticipated, promoting sufficient clearance access for filter replacement. Multi-occupant spaces will be provided with 3'x3' cassettes with high efficiency (MERV 10 or higher) disposable filters. Single occupant spaces will be provided with 2'x2' cassettes with the VRF manufacturer's standard washable filter.

A dedicated DOAS unit with supply and exhaust fans, an enthalpy wheel for pre-conditioning outdoor air, a hot gas reheat coil for tempering supply air, and a DX heat pump coil with water-cooled compressors will be provided to deliver conditioned ventilation airflow to the administration areas served. The DOAS unit will be installed on a roof curb above the classroom wing corridor and located adjacent to the DOAS units and heat pump chillers described previously. Airflow supplied from this DOAS unit will be dehumidified, conditioned, and delivered directly to each space. Exhaust airflow from the offices, restrooms, and storage room areas will be routed through the DOAS unit's enthalpy wheel for pre-conditioning of outdoor air.

Media Center HVAC System

An extended range large capacity vertical heat pump unit will be provided for space conditioning within the media center area. This heat pump unit will be similar to those provided for the school's general classroom areas; however, also provided with multiple compressors and hot-gas reheat to accomplish room level humidity control. This heat pump unit will be positioned with a mechanical room located adjacent to the media center. Conditioned ventilation air for the media center will be provided by the classroom DOAS units described previously.

Gymnasium HVAC Systems

An indoor air handling unit with heat pump type water-cooled compressor, and hot gas reheat coil will provide space conditioning and ventilation for the gymnasium area. The water-cooled compressors will be connected to the heat pump loop. Full airside economizer and enthalpy wheel energy recovery devices will be provided where required by the International Energy Conservation Code. Demand control ventilation will be provided for the units serving the Gymnasium. This air handling unit will be positioned within a mechanical room located adjacent to the gymnasium space

Cafe/Multi-Purpose Room HVAC Systems

An indoor air handling unit with heat pump type water-cooled compressor, and hot gas reheat coil will provide space conditioning and ventilation for the cafe/multipurpose room. The water-cooled compressor will be connected to the heat pump loop. Full airside economizer and enthalpy wheel energy recovery devices will be provided where required by the International Energy Conservation Code. Demand control ventilation will be provided for the units serving the Cafe/Multipurpose Room. This air handling unit will be located within a mechanical room located adjacent to the multipurpose room space.

Kitchen HVAC Systems

An indoor air handling unit with heat pump type water-cooled compressor, and hot gas reheat coil will provide space conditioning and ventilation for the kitchen. The air handling unit will be located within the penthouse mechanical room and the water-cooled compressor will be connected to the heat pump loop. Full airside economizer and enthalpy wheel energy recovery devices will be provided where required by the International Energy Conservation Code. General exhaust from the kitchen restroom, storage rooms, and the kitchen space itself will be routed to a rooftop exhaust fan. A separate rooftop exhaust fan will also be provided for serving the kitchen's associated exhaust hood.

Pool Area HVAC Systems

Space conditioning and ventilation for the pool will be provided by a pair of indoor single-zone variable air volume, heat pump type, air-handling units. The heat pump units will be air-source with split condensing units located on the roof of the pool area. The air handling unit will be positioned inside the mechanical room adjacent to the pool area. Auxiliary heating will be provided by two new hydronic duct heating coils. Heating water will be generated by an air-source, heat pump type, water heater. A new inline pump, expansion tank, and air separator will be provided for the heating water system. A new heat exchanger and pool water pump will also be provided with a pool water circuit piped to the air handling units and heat exchanger for pool water heating.

Miscellaneous Building Areas

Data, Telecomm, and Elevator Room will be served by ductless split systems. Heating-only type spaces such as mechanical rooms, electrical rooms, stairs, storage rooms, and entry vestibules will be provided with electric cabinet and propeller unit heaters. In addition, a dedicated switch-operated exhaust fan will also be provided within the health suite area and within the administration workroom.

Building Automation Control System

Automatic temperature controls will be direct digital type controls (DDC). Actuation will be electric / electronic for all systems. All system components will be installed in accordance with MCPS standards and networked to the existing front-end server located at the MCPS Energy Management Office.

PLUMBING SYSTEMS

Domestic Water Piping Systems (Including Water Service Entrance)

A new combination fire/water service will enter the school within the first floor mechanical room. The new combination fire/water service will be capable of supporting both the fire and water service demands of the school. A new domestic water service, complete with basket strainer and backflow preventer will separate the domestic water and fire services prior to distributing water throughout the school. Domestic water piping will be distributed from this first floor mechanical room area to plumbing fixtures and equipment located throughout the school. The existing domestic water piping will be replaced throughout the entire school.

Domestic Hot Water Heater System

Domestic hot water for the proposed renovation and addition concept will be generated by a pair of electric resistance tank type domestic water heaters. Domestic hot water will be generated at 140-degrees F, with 120-degrees F domestic hot water distributed throughout the school. Local thermostatic mixing valves will reduce the water temperature to 110-degrees F at hand washing fixtures. The piping loop will be complete with a dedicated hot water circulation pump and expansion tank.

Storm Water Piping Systems

Storm water drainage, including roof drains, overflow drains, and storm water piping systems will be replaced to the greatest extent possible throughout the entire school. Above- and below-grade storm water piping will be constructed from PVC material. All storm water piping systems will exit the school at various locations and coordinate with available site piping connections provided for the proposed renovation and addition option.

Roof drains with interior storm water piping are anticipated for flat roof areas. Roof gutters with exterior downspouts are anticipated for sloped roof areas. Cast iron storm water leader shoes will be provided where downspouts transition to below grade storm water piping before connecting to the site storm water system.

Sanitary and Vent Piping Systems

Sanitary waste and vent piping systems will be replaced to the greatest extent possible throughout the entire school. Above- and below-grade sanitary and vent piping will be constructed from PVC material. Vent piping will terminate at the roof level, with a minimum 25-foot separation provided between vent piping terminations and any outdoor air intake locations. Sanitary piping systems will exit the building at various locations and will coordinate with the available site piping connections provided for the proposed renovation and addition option.

The following special sanitary and vent piping systems are anticipated:

- Equipment and sinks that may discharge grease into the sanitary system from the kitchen will be piped to a new underground concrete grease interceptor. The discharge from this interceptor will be connected to site sanitary piping system.
- Sinks within the art classrooms will be provided with solids interceptors, collecting debris and preventing it from entering the site sanitary piping system.

Plumbing Fixtures

The school’s existing plumbing fixtures will be replaced under Option 3a. Institutional grade replacement plumbing fixtures will be provided that include floor-mounted water closets utilizing 1.28 gallon per flush valves, pint flush (0.125 gallon per flush) wall-hung urinals, and wall-hung lavatories with hot and cold water faucets with low flow aerators. The water consumption figures noted are equal to or less than what is required by the current plumbing code and for promoting good water conservation practices. All new plumbing fixtures will be ADA compliant.

Gas Piping Systems

The existing Piney Branch ES indoor natural gas service, associated meter, and interior gas piping will be replaced to accommodate the proposed renovation and addition scope of work. A new natural gas service will be provided by Washington Gas for the school. The gas service meter and pressure reducing station will be positioned outdoors and located near the main mechanical room. Gas piping will serve the emergency generator only.

FIRE PROTECTION SYSTEMS

Sprinkler System

The entire building will be fully sprinklered, with the sprinkler system separated into several zones that will match the fire alarm pull zones for the building. The existing sprinkler heads and associated branch sprinkler piping will be removed and replaced throughout the school, with new sprinkler piping extending from the new combination fire/water service entering the school within the first floor mechanical room.

A fire flow test will be performed during the early stages of design to confirm the available municipal water pressure and determine if a fire pump is required to support the proposed sprinkler system. A fire pump is not currently anticipated based on the available water pressure at the existing school. All work will be specified to conform to standards of the National Fire Protection Association (NFPA) and will include requirements for performance verification through hydraulic calculations.

Fire Detection and Alarm System

The existing fire detection and alarm system will be demolished and replaced throughout the entire building.

The fire detection and alarm system will comply with State of Maryland Fire Code, local authorities having jurisdiction, International Building Code, and NFPA. The fire detection and alarm system will be a stand-alone, addressable, and will have voice evacuation capability. The main fire alarm control panel (FACP) will be located either in the main telecom room or in a location as directed by MCPS. The FACP will be equipped with battery backup. The fire alarm annunciator with graphic display and adjacent keypad will be located at the main building entrance vestibule or lobby.

Initiation devices include manual pull stations, smoke detectors, duct smoke detectors, heat detectors, and carbon monoxide detectors (where gas-fired equipment is used). Notification devices include fire alarm combination speaker/strobe devices, strobes, and fire alarm speakers. The fire detection and alarm system will be connected to the lighting control system to facilitate the automatic illumination of the path of egress upon initiation of the fire alarm system.

ELECTRICAL SYSTEMS

General

The proposed Option #3a – Replacement concept demolishes the existing Piney Branch ES building and constructs a new building with a pool on the existing site. The existing electrical distribution equipment, lighting fixtures, lighting controls, receptacles, voice/data system, public address system, and security system components will be demolished and replaced. A new main electrical room and auxiliary electrical room will be provided within the existing building foot print within the existing main mechanical space. Existing spaces within the school will be renovated in their entirety under the scope of this project option.

The electrical systems will include work associated with power, generator power, lighting, lighting controls, intercom/public address systems. Power provisions will be provided for classroom technology, data, voice, building security (door access control, intrusion detection, video surveillance), and food service. The electrical systems, in concert with the architectural, mechanical, communications, electronic safety and security, and food service considerations, are intended to create spaces that are flexible, functional, energy-efficient and respond to the needs of this facility.

The electrical design will comply with applicable codes, regulations, standards, and authorities having jurisdiction. Sustainable technologies will be incorporated into the design to meet requirements of the Maryland Green Building Council - High-Performance Green Building Program, which requires compliance with either USGBC LEED v4 (minimum LEED Silver certification), GBI Green Globes (minimum two Green Globes), or Maryland Green Building Council-adopted version of International Green Construction Code (IgCC).

Electrical Service

A new outdoor Pepco utility transformer will be provided near the new main electrical room. Montgomery County Public School (MCPS) prefers pad-mounted utility transformers over the existing utility transformer vault, therefore, a pad-mounted utility transformer option will be explored with PEPCO. A secondary service concrete-encased ductbank (with minimum 10 ducts) will be run from the utility transformer to the CT section of the new main switchboard in the new main electrical room.

Power Distribution

The new main electrical room will consist of the new main switchboard, dry-type transformer(s), distribution panelboard, lighting panelboard, and branch circuit panelboards.

A separate "auxiliary" electrical room will be provided within the new main electrical room for new generator-connected equipment. Generator-connected equipment will consist of enclosed switches, automatic transfer switches, dry-type transformers, and panelboards.

The new main switchboard will be connected to Pepco utility power, will be rated at 2,000 amperes, 277/480 volts, 3-phase, 4-wire, will incorporate ground fault protection and surge protection, and will have a CT section, a tap section for connection of future on-site photovoltaic (PV) system, main section with 2,000-ampere main circuit breaker, and distribution section(s) with molded-case feeder circuit breakers. The main switchboard will serve mechanical loads and panelboards, lighting panelboards, and general receptacle branch circuit panelboards (via step-down transformers) in the main electrical room and electrical closets throughout the school. The main switchboard will be sized with spare capacity and space for future circuit breakers in order to accommodate any future renovations to the school.

The Maryland Emergency Management Agency (MEMA) may designate Piney Branch ES as an emergency public shelter. Electrical equipment for the MEMA emergency public shelter will include a 3,000-ampere outdoor generator docking station or outdoor quick-connect generator switchboard, with multiple cam-lock connectors per phase, in order to connect a temporary portable generator to the main switchboard. An additional main section with 3,000A main circuit breaker will be required at the main switchboard and connected to the outdoor generator docking station or outdoor quick-connect generator switchboard. The main circuit breakers of the switchboard will be key-interlocked so that only one main circuit breaker can be "closed" at a time to prevent simultaneous closure. The gymnasium / multi-purpose room, cafetorium / multi-purpose room, food service, and corridors connecting these spaces will be designated by MEMA to be used as an emergency public shelter, with the electrical loads and mechanical equipment supporting these spaces to be operational when connected to a temporary portable generator. MCPS may request MEMA for a waiver to not designate Piney Branch ES as an emergency public shelter.

Panelboards will be rated at 277/480 volts and 120/208 volts and serve as distribution, lighting, or branch circuit panels. There will be dedicated panelboards for lighting, mechanical loads, and receptacle plug loads. Panelboards will have a copper bus structure. Panelboards will be sized with approximately 25 percent spare capacity and 25 percent spare breaker space. A three-phase surge protective device (SPD) will be mounted adjacent to each respective emergency (life-safety) panel, lighting panel, and receptacle / plug load branch circuit panel. Panelboard circuit directories will be typed. 120/208-volt panelboards will be located such that branch circuit wiring is not run over 150 feet, to avoid long distances and increased wire sizes due to voltage drop.

The typical dry-type transformer will be general-purpose, energy-efficient type, complying with DOE 2016, and will have a 480-volt delta primary, and 208/120-volt, three-phase, four-wire, wye secondary.

Lighting will be connected at 277 volts, single-phase. Mechanical equipment will be connected at either 120 volts, single-phase; 208 volts, single-phase; 208 volts, 3-phase; 277 volts, single-phase; or 480 volts, 3 phase, depending upon the load requirements. Motors one horsepower or larger will be connected at 480 volts, 3-phase. General receptacles will be connected at 120 volts, single-phase. Each feeder and branch circuit will have a separate copper grounding conductor in the same raceway.

Rigid galvanized steel (RGS) conduit will be used in the first five feet of underground conduit extending outside of the building, under roads and paved areas where existing pavement is not to be disturbed, and for elbows penetrating floor slabs, exterior walls, or bearing walls. Intermediate metal conduit (IMC) will be used for wiring to exterior equipment. Electrical metallic tubing (EMT) will be used in interior spaces, except where RGS is required. Polyvinylchloride (PVC) conduit will be used for underground feeders and circuits, except where RGS is required. Flexible metal conduit (FMC) will be used to connect to transformers. Liquid-tight flexible metal conduit (LFMC) will be used to connect to motors and other vibrating equipment. FMC and LFMC will be limited to a maximum 6-foot length. The minimum size conduit will be 3/4 inches.

The wiring system will be copper conductors with THHN/THWN-2 insulation. MCPS allows the use of aluminum feeders for feeders 100 amperes (#2 AWG) and larger. For branch circuit wiring, Type MC cable will be allowed to be installed in concealed ceiling spaces, drywall partitions, and casework within instructional spaces. EMT conduit will be used in rooms with open ceilings, in masonry partitions, and masonry walls.

Receptacle branch circuits will utilize #12 wiring when the run is 50 linear feet or less, #10 wiring when the run is more between 50 and 100 linear feet, and #8 wiring when the run is over 100 linear feet.

Tamper-resistant receptacles will be provided throughout to meet NEC requirements for educational facilities. Convenience receptacles will be provided throughout, including multiple locations within classrooms, including at teacher's desk, teacher's wardrobe, and "computer cart" charging station. Receptacle device plates will be labeled with circuit designations. Overhead cord reels with receptacle connections may be provided in technology education spaces.

Switched / controlled receptacles will be provided to meet the IECC requirement that at least 50% of 120-volt 20-ampere receptacles in classrooms, private offices, conference rooms, work rooms, and staff break room. Switched / controlled receptacles will be connected to the lighting controls system and controlled by occupancy sensor(s) in respective room.

Electrical provisions will be made for electric vehicle (EV) charging stations in the parking lot.

<u>Solar Photovoltaic</u>

Electrical provisions will be made for a future solar photovoltaic (PV) system in order for the school to be solar PV ready. These provisions will include a dedicated tap section for PV system connection at the main switchboard and underground raceways for PV canopies. Raceways for PV system components located on the roof will be provided by the PV System Installer.

<u>Generator Power</u>

There will be an onsite outdoor natural-gas generator with weatherproof, sound-attenuated enclosure, sized to accommodate emergency / life-safety and standby loads via automatic transfer switches. The generator will be rated at 277/480 volts, 3-phase, 4-wire. The estimated size for the generator is 150 kW. The basis-of-design generator manufacturer will be Rehlko (formerly Kohler) Power Systems.

Enclosed circuit breakers mounted at the generator will serve automatic transfer switches located in the "auxiliary" electrical room within the main electrical room. The first automatic transfer switch (ATS) will be for emergency / life safety loads and will connect to emergency panelboard(s). Emergency panelboard(s) will provide power to emergency egress lighting in corridors and instructional spaces, and exit signs. The second ATS will be the "standby" ATS and will connect to standby panelboards.

Standby panelboards will serve data/voice communications equipment in telecom rooms, automatic temperature control (ATC) / building management system control panels, kitchen cooler/freezer, refrigerator in health suite, intercom/public address equipment, security equipment, fire detection and alarm equipment, heaters/heat trace for rooftop equipment and outdoor piping, elevator cab, sump pumps, and other equipment and devices as determined by MCPS. The "standby" ATS will also serve selected receptacles in the principal's office, main office, health suite, corridors, gymnasium, cafeteria, kitchen, and classrooms.

Article 700 Emergency Systems, Section 700.3(F) of the NEC requires a generator docking station to be provided on the emergency / life-safety power distribution system to allow for connecting to a temporary portable generator when the permanent on-site generator needs maintenance or repair. The generator docking station will be connected between the emergency output circuit breaker of the on-site generator and the emergency automatic transfer switch. The generator docking station will have provisions to connect to a load bank via cam lock connectors. The generator docking station will be sized to accommodate the entire generator load and will be located at the building exterior adjacent to the generator.

Overcurrent devices are required by the NEC to be "selectively coordinated" from the generator down to the branch circuit overcurrent devices on the emergency / life-safety panelboard(s). The NEC requires selective coordination on the "full range of overcurrent protective device opening times associated with those overcurrents". In order to meet this requirement, fuse-type panelboards will be utilized for emergency / life safety panelboards. Spare fuse cabinet with 25% spare fuses will be located next to fuse-type panelboards.

Lighting

Luminaires (lighting fixtures) will utilize LED light sources. LED luminaires in corridors, classrooms, instructional spaces, offices, workrooms, seminar rooms, storage rooms, group toilet rooms, and rooms with lay-in ceilings will be recessed 2' x 2' or 2' x 4' LED luminaires. Recessed LED downlights will be used where smaller luminaires are appropriate. High abuse wall-mounted LED luminaires will be used in stairwells. LED strip luminaires will be used in support spaces with open ceilings. High-bay "UFO" style luminaires will be provided in the gymnasium. Architectural LED luminaires will be provided in the main vestibule, main lobby, media center, and cafetorium / multi-purpose room.

For specialty pendant-mounted lighting in high ceilings, remote drivers will not be located in high ceiling spaces. LED tunable white lighting fixtures will be provided in special education instructional spaces. Emergency lighting and exit signs with red lettering will be provided where required. Exit signs will be LED type.

Exterior full-cutoff dark-sky compliant LED building-mounted luminaires will be provided. Exterior luminaires will include building-mounted luminaires around the perimeter of the building, and pole-mounted luminaires for parking, drop-off, and bus loop. Luminaires will be located so as not to exceed the maximum lighting levels beyond the property line. The finish of exterior luminaires will be selected by the Architect.

The lighting design will comply with 2021 International Energy Conservation Code (IECC) and Maryland Green Building Council - High Performance Green Building Program. Lighting power density (LPD) will not exceed 0.61 watts per square foot, which is 15% better than 0.72 watts per square foot for a school building in the IECC. The selection of lighting fixtures for the building will be compliant with the energy code.

Lighting levels will be designed in accordance with the recommendations of the Illuminating Engineering Society (IES). Maintained illumination values will be calculated using a total maintenance factor of 90 percent. Classrooms will have an average between 30 and 50 foot-candles at the task plane. The correlate color temperature (CCT) rating will be 3500 Kelvin for interior luminaires and 3000 Kelvin for exterior luminaires per MCPS requirements.

Lighting Controls

Switching of luminaires will have ON/OFF and RAISE/LOWER lighting level capability in regularly occupied spaces and will be zoned as appropriate for larger spaces. Occupancy sensors will be utilized for automatic control of both interior and exterior lighting. In addition, an astronomic time switch / time clock will be used to turn ON/OFF exterior lighting if needed.

Lighting controls in classrooms and instructional spaces will include a dedicated lighting load relay controller (to be located in accessible ceiling space near respective entrance/egress door), low-voltage lighting control stations, and ceiling occupancy sensor(s).

Luminaires in each classroom and instructional space will be on one zone controlled by local lighting control stations. The lighting control station located at each entrance/egress door will provide ON/OFF capability. The lighting control station located at the teacher station will provide ON/OFF and RAISE/LOWER lighting level capability. Luminaires will be turned-on at a 50% lighting level. Additional lighting control stations will be provided per MCPS requirements.

One luminaire in each classroom will also be connected to an emergency lighting circuit (via UL 924 relay or generator transfer device) and will be automatically switched ON during a power outage.

Occupancy sensors in classrooms, other instructional spaces, offices, workrooms, seminar rooms, and storage rooms will be set to "vacancy" mode, meaning that lighting in these spaces will need to be manually turned ON via local lighting control wall station. Occupancy sensors in group toilet rooms, individual toilet rooms, vestibules, corridors, and stairwells will be set to "occupancy" mode, meaning that lighting in these spaces will be automatically turned ON when occupied.

Automatic daylight controls (daylight photocell/sensor that automatically dims lighting when there is sufficient daylight in a space) for daylight harvesting will be utilized only where required per 2021 International Energy Conservation Code (IECC). Daylight harvesting will be required in rooms where there is more than 150 watts of general lighting within a sidelight or toplight daylight zones.

In compliance with 2021 NFPA 101 (Life Safety Code), Sections 7.8.1.2.2, 7.8.1.2.3 and A.7.8.1.2.3, where occupancy sensors are used to control lighting fixtures within the means of egress (corridors, stairs), lighting fixtures will automatically be illuminated to full output upon activation of the building fire alarm system.

In order to meet 2021 IECC, Section C405.2.7.3, for lighting setback, each exterior building-mounted luminaire will have an integral occupancy sensor to dim lighting to 50 percent lighting level when occupancy is not detected for 5 minutes.

Lightning Protection

Lightning protection will not be provided. Building systems will be protected from lightning-induced currents and transients by surge protective devices (SPD's) at the main switchboard, generator emergency / life-safety panelboards (per NEC), generator standby panelboards, lighting panelboards, and receptacle branch circuit panelboards. If the grounding system is installed and connected correctly (to ground ring, to building steel, to cold water pipes, and to structural footer), the SPD's will work properly to protect equipment.

Public Address System:

Intercommunications/public address system devices will include speakers and call switches. Stand-alone sound reinforcement systems will be provided in the multipurpose room, main gymnasium, auxiliary gym, dance rooms, and music rooms per MCPS standards.

Security System:

Security systems will include door access control (card readers), intrusion detection (keypads and motion detectors), and video surveillance (cameras). Distributed antenna system will be provided for public safety radio for first responders.

Technology Infrastructure:

The school will have communications (data and voice) systems including wireless access points throughout for Wi-Fi. Provisions for audio/visual systems for instructional technology will be provided.

OPTION 3b –RENOVATION + ADDITION CONCEPT (WITHOUT POOL)

MECHANICAL SYSTEMS

General

Project Option 3b - Renovation and Addition (without pool) – demolishes more than 50% of the existing school, while providing a multi-story building addition on the south side of the building and comprehensive renovations throughout the existing school. The existing pool space will be renovated and reprogrammed as the new multi-purpose room and kitchen area. The existing mechanical, plumbing, and fire protection systems will be replaced throughout the school under this option. Construction will be accomplished by temporarily relocating teachers and students to another school during construction.

A geothermal heat pump system, with a the wellfield located under the parking lot area or the adjacent park area, will be investigated further during design. At this time a geothermal system does not appear feasible due to limited site area.

The proposed mechanical, plumbing, and fire protection systems are identical to the systems proposed for Option 3a except the pool systems will not be provided.

ELECTRICAL SYSTEMS

General

The proposed Option #3b – Replacement concept demolishes the existing Piney Branch ES building and constructs a new building without a pool on the existing site. The existing electrical distribution equipment, lighting fixtures, lighting controls, receptacles, voice/data system, public address system, and security system components will be demolished and replaced. A new main electrical room and auxiliary electrical room will be provided within the existing building foot print within the existing main mechanical space. Existing spaces within the school will be renovated in their entirety under the scope of this project option.

The electrical systems will include work associated with power, generator power, lighting, lighting controls, intercom/public address systems. Power provisions will be provided for classroom technology, data, voice, building security (door access control, intrusion detection, video surveillance), and food service. The electrical systems, in concert with the architectural, mechanical, communications, electronic safety and security, and food service considerations, are intended to create spaces that are flexible, functional, energy-efficient and respond to the needs of this facility.

The electrical design will comply with applicable codes, regulations, standards, and authorities having jurisdiction. Sustainable technologies will be incorporated into the design to meet requirements of the Maryland Green Building Council - High-Performance Green Building Program, which requires compliance with either USGBC LEED v4 (minimum LEED Silver certification), GBI Green Globes (minimum two Green Globes), or Maryland Green Building Council-adopted version of International Green Construction Code (IgCC).

Electrical Service

A new outdoor Pepco utility transformer will be provided near the new main electrical room. Montgomery County Public School (MCPS) prefers pad-mounted utility transformers over the existing utility transformer vault, therefore, a pad-mounted utility transformer option will be explored with PEPCO. A secondary service concrete-encased ductbank (with minimum 10 ducts) will be run from the utility transformer to the CT section of the new main switchboard in the new main electrical room.

Power Distribution

The new main electrical room will consist of the new main switchboard, dry-type transformer(s), distribution panelboard, lighting panelboard, and branch circuit panelboards.

A separate "auxiliary" electrical room will be provided within the new main electrical room for new generator-connected equipment. Generator-connected equipment will consist of enclosed switches, automatic transfer switches, dry-type transformers, and panelboards.

The new main switchboard will be connected to Pepco utility power, will be rated at 2,000 amperes, 277/480 volts, 3-phase, 4-wire, will incorporate ground fault protection and surge protection, and will have a CT section, a tap section for connection of future on-site photovoltaic (PV) system, main section with 2,000-ampere main circuit breaker, and distribution section(s) with molded-case feeder circuit breakers. The main switchboard will serve mechanical loads and panelboards, lighting panelboards, and general receptacle branch circuit panelboards (via step-down transformers) in the main electrical room and electrical closets throughout the school. The main switchboard will be sized with spare capacity and space for future circuit breakers in order to accommodate any future renovations to the school.

The Maryland Emergency Management Agency (MEMA) may designate Piney Branch ES as an emergency public shelter. Electrical equipment for the MEMA emergency public shelter will include a 3,000-ampere outdoor generator docking station or outdoor quick-connect generator switchboard, with multiple cam-lock connectors per phase, in order to connect a temporary portable generator to the main switchboard. An additional main section with 3,000A main circuit breaker will be required at the main switchboard and connected to the outdoor generator docking station or outdoor quick-connect generator switchboard. The main circuit breakers of the switchboard will be key-interlocked so that only one main circuit breaker can be "closed" at a time to prevent simultaneous closure. The gymnasium / multi-purpose room, cafetorium / multi-purpose room, food service, and corridors connecting these spaces will be designated by MEMA to be used as an emergency public shelter, with the electrical loads and mechanical equipment supporting these spaces to be operational when connected to a temporary portable generator. MCPS may request MEMA for a waiver to not designate Piney Branch ES as an emergency public shelter.

Panelboards will be rated at 277/480 volts and 120/208 volts and serve as distribution, lighting, or branch circuit panels. There will be dedicated panelboards for lighting, mechanical loads, and receptacle plug loads. Panelboards will have a copper bus structure. Panelboards will be sized with approximately 25 percent spare capacity and 25 percent spare breaker space. A three-phase surge protective device (SPD) will be mounted adjacent to each respective emergency (life-safety) panel, lighting panel, and receptacle / plug load branch circuit panel. Panelboard circuit directories will be typed. 120/208-volt panelboards will be located such that branch circuit wiring is not run over 150 feet, to avoid long distances and increased wire sizes due to voltage drop.

The typical dry-type transformer will be general-purpose, energy-efficient type, complying with DOE 2016, and will have a 480-volt delta primary, and 208/120-volt, three-phase, four-wire, wye secondary.

Lighting will be connected at 277 volts, single-phase. Mechanical equipment will be connected at either 120 volts, single-phase; 208 volts, single-phase; 208 volts, 3-phase; 277 volts, single-phase; or 480 volts, 3 phase, depending upon the load requirements. Motors one horsepower or larger will be connected at 480 volts, 3-phase. General receptacles will be connected at 120 volts, single-phase. Each feeder and branch circuit will have a separate copper grounding conductor in the same raceway.

Rigid galvanized steel (RGS) conduit will be used in the first five feet of underground conduit extending outside of the building, under roads and paved areas where existing pavement is not to be disturbed, and for elbows penetrating floor slabs, exterior walls, or bearing walls. Intermediate metal conduit (IMC) will be used for wiring to exterior equipment. Electrical metallic tubing (EMT) will be used in interior spaces, except where RGS is required. Polyvinylchloride (PVC) conduit will be used for underground feeders and circuits, except where RGS is required. Flexible metal conduit (FMC) will be used to connect to transformers. Liquid-tight flexible metal conduit (LFMC) will be used to connect to motors and other vibrating equipment. FMC and LFMC will be limited to a maximum 6-foot length. The minimum size conduit will be 3/4 inches.

The wiring system will be copper conductors with THHN/THWN-2 insulation. MCPS allows the use of aluminum feeders for feeders 100 amperes (#2 AWG) and larger. For branch circuit wiring, Type MC cable will be allowed to be installed in concealed ceiling spaces, drywall partitions, and casework within instructional spaces. EMT conduit will be used in rooms with open ceilings, in masonry partitions, and masonry walls.

Receptacle branch circuits will utilize #12 wiring when the run is 50 linear feet or less, #10 wiring when the run is more between 50 and 100 linear feet, and #8 wiring when the run is over 100 linear feet.

Tamper-resistant receptacles will be provided throughout to meet NEC requirements for educational facilities. Convenience receptacles will be provided throughout, including multiple locations within classrooms, including at teacher's desk, teacher's wardrobe, and "computer cart" charging station. Receptacle device plates will be labeled with circuit designations. Overhead cord reels with receptacle connections may be provided in technology education spaces.

Switched / controlled receptacles will be provided to meet the IECC requirement that at least 50% of 120-volt 20-ampere receptacles in classrooms, private offices, conference rooms, work rooms, and staff break room. Switched / controlled receptacles will be connected to the lighting controls system and controlled by occupancy sensor(s) in respective room.

Electrical provisions will be made for electric vehicle (EV) charging stations in the parking lot.

<u>Solar Photovoltaic</u>

Electrical provisions will be made for a future solar photovoltaic (PV) system in order for the school to be solar PV ready. These provisions will include a dedicated tap section for PV system connection at the main switchboard and underground raceways for PV canopies. Raceways for PV system components located on the roof will be provided by the PV System Installer.

<u>Generator Power</u>

There will be an onsite outdoor natural-gas generator with weatherproof, sound-attenuated enclosure, sized to accommodate emergency / life-safety and standby loads via automatic transfer switches. The generator will be rated at 277/480 volts, 3-phase, 4-wire. The estimated size for the generator is 150 kW. The basis-of-design generator manufacturer will be Rehlko (formerly Kohler) Power Systems.

Enclosed circuit breakers mounted at the generator will serve automatic transfer switches located in the "auxiliary" electrical room within the main electrical room. The first automatic transfer switch (ATS) will be for emergency / life safety loads and will connect to emergency panelboard(s). Emergency panelboard(s) will provide power to emergency egress lighting in corridors and instructional spaces, and exit signs. The second ATS will be the "standby" ATS and will connect to standby panelboards.

Standby panelboards will serve data/voice communications equipment in telecom rooms, automatic temperature control (ATC) / building management system control panels, kitchen cooler/freezer, refrigerator in health suite, intercom/public address equipment, security equipment, fire detection and alarm equipment, heaters/heat trace for rooftop equipment and outdoor piping, elevator cab, sump pumps, and other equipment and devices as determined by MCPS. The "standby" ATS will also serve selected receptacles in the principal's office, main office, health suite, corridors, gymnasium, cafeteria, kitchen, and classrooms.

Article 700 Emergency Systems, Section 700.3(F) of the NEC requires a generator docking station to be provided on the emergency / life-safety power distribution system to allow for connecting to a temporary portable generator when the permanent on-site generator needs maintenance or repair. The generator docking station will be connected between the emergency output circuit breaker of the on-site generator and the emergency automatic transfer switch. The generator docking station will have provisions to connect to a load bank via cam lock connectors. The generator docking station will be sized to accommodate the entire generator load and will be located at the building exterior adjacent to the generator.

Overcurrent devices are required by the NEC to be "selectively coordinated" from the generator down to the branch circuit overcurrent devices on the emergency / life-safety panelboard(s). The NEC requires selective coordination on the "full range of overcurrent protective device opening times associated with those overcurrents". In order to meet this requirement, fuse-type panelboards will be utilized for emergency / life safety panelboards. Spare fuse cabinet with 25% spare fuses will be located next to fuse-type panelboards.

Lighting

Luminaires (lighting fixtures) will utilize LED light sources. LED luminaires in corridors, classrooms, instructional spaces, offices, workrooms, seminar rooms, storage rooms, group toilet rooms, and rooms with lay-in ceilings will be recessed 2' x 2' or 2' x 4' LED luminaires. Recessed LED downlights will be used where smaller luminaires are appropriate. High abuse wall-mounted LED luminaires will be used in stairwells. LED strip luminaires will be used in support spaces with open ceilings. High-bay "UFO" style luminaires will be provided in the gymnasium. Architectural LED luminaires will be provided in the main vestibule, main lobby, media center, and cafetorium / multi-purpose room.

For specialty pendant-mounted lighting in high ceilings, remote drivers will not be located in high ceiling spaces. LED tunable white lighting fixtures will be provided in special education instructional spaces. Emergency lighting and exit signs with red lettering will be provided where required. Exit signs will be LED type.

Exterior full-cutoff dark-sky compliant LED building-mounted luminaires will be provided. Exterior luminaires will include building-mounted luminaires around the perimeter of the building, and pole-mounted luminaires for parking, drop-off, and bus loop. Luminaires will be located so as not to exceed the maximum lighting levels beyond the property line. The finish of exterior luminaires will be selected by the Architect.

The lighting design will comply with 2021 International Energy Conservation Code (IECC) and Maryland Green Building Council - High Performance Green Building Program. Lighting power density (LPD) will not exceed 0.61 watts per square foot, which is 15% better than 0.72 watts per square foot for a school building in the IECC. The selection of lighting fixtures for the building will be compliant with the energy code.

Lighting levels will be designed in accordance with the recommendations of the Illuminating Engineering Society (IES). Maintained illumination values will be calculated using a total maintenance factor of 90 percent. Classrooms will have an average between 30 and 50 foot-candles at the task plane. The correlate color temperature (CCT) rating will be 3500 Kelvin for interior luminaires and 3000 Kelvin for exterior luminaires per MCPS requirements.

Lighting Controls

Switching of luminaires will have ON/OFF and RAISE/LOWER lighting level capability in regularly occupied spaces and will be zoned as appropriate for larger spaces. Occupancy sensors will be utilized for automatic control of both interior and exterior lighting. In addition, an astronomic time switch / time clock will be used to turn ON/OFF exterior lighting if needed.

Lighting controls in classrooms and instructional spaces will include a dedicated lighting load relay controller (to be located in accessible ceiling space near respective entrance/egress door), low-voltage lighting control stations, and ceiling occupancy sensor(s).

Luminaires in each classroom and instructional space will be on one zone controlled by local lighting control stations. The lighting control station located at each entrance/egress door will provide ON/OFF capability. The lighting control station located at the teacher station will provide ON/OFF and RAISE/LOWER lighting level capability. Luminaires will be turned-on at a 50% lighting level. Additional lighting control stations will be provided per MCPS requirements.

One luminaire in each classroom will also be connected to an emergency lighting circuit (via UL 924 relay or generator transfer device) and will be automatically switched ON during a power outage.

Occupancy sensors in classrooms, other instructional spaces, offices, workrooms, seminar rooms, and storage rooms will be set to "vacancy" mode, meaning that lighting in these spaces will need to be manually turned ON via local lighting control wall station. Occupancy sensors in group toilet rooms, individual toilet rooms, vestibules, corridors, and stairwells will be set to "occupancy" mode, meaning that lighting in these spaces will be automatically turned ON when occupied.

Automatic daylight controls (daylight photocell/sensor that automatically dims lighting when there is sufficient daylight in a space) for daylight harvesting will be utilized only where required per 2021 International Energy Conservation Code (IECC). Daylight harvesting will be required in rooms where there is more than 150 watts of general lighting within a sidelight or toplight daylight zones.

In compliance with 2021 NFPA 101 (Life Safety Code), Sections 7.8.1.2.2, 7.8.1.2.3 and A.7.8.1.2.3, where occupancy sensors are used to control lighting fixtures within the means of egress (corridors, stairs), lighting fixtures will automatically be illuminated to full output upon activation of the building fire alarm system.

In order to meet 2021 IECC, Section C405.2.7.3, for lighting setback, each exterior building-mounted luminaire will have an integral occupancy sensor to dim lighting to 50 percent lighting level when occupancy is not detected for 5 minutes.

Lightning Protection

Lightning protection will not be provided. Building systems will be protected from lightning-induced currents and transients by surge protective devices (SPD's) at the main switchboard, generator emergency / life-safety panelboards (per NEC), generator standby panelboards, lighting panelboards, and receptacle branch circuit panelboards. If the grounding system is installed and connected correctly (to ground ring, to building steel, to cold water pipes, and to structural footer), the SPD's will work properly to protect equipment.

Public Address System:

Intercommunications/public address system devices will include speakers and call switches. Stand-alone sound reinforcement systems will be provided in the multipurpose room, main gymnasium, auxiliary gym, dance rooms, and music rooms per MCPS standards.

Security System:

Security systems will include door access control (card readers), intrusion detection (keypads and motion detectors), and video surveillance (cameras). Distributed antenna system will be provided for public safety radio for first responders.

Technology Infrastructure:

The school will have communications (data and voice) systems including wireless access points throughout for Wi-Fi. Provisions for audio/visual systems for instructional technology will be provided.

OPTION 4a - REPLACEMENT SCHOOL CONCEPT (WITH POOL)

MECHANICAL SYSTEMS

General

The proposed Option #4a - Replacement School Concept (with pool) includes demolition of the existing school and construction of a new onsite building.

A geothermal heat pump system, with a the wellfield located under the parking lot area or the adjacent park area, will be investigated further during design. At this time a geothermal system does not appear feasible due to limited site area.

The following mechanical system is recommended to support the proposed replacement school concept. This mechanical system provides a high level of overall energy efficiency and good thermal comfort for building occupants.

Heating and Cooling Infrastructure Systems

A centralized air-to-water heat pump unit system is recommended to support the replacement school concept. This type of mechanical system provides the ability to have independent heating or cooling year-round, while delivering an extremely high level of overall building energy efficiency.

> Chilled/Heating Water Side of Heat Exchanger: A pair of air-to-water, two-pipe, heat pump chillers will generate either heating water or chilled water for the centralized air-to-water heat pump system. These heat pump chillers will be located on the roof. Three base-mounted chilled/heating water pumps (two active and one stand-by) will circulate a propylene glycol-water mixture between the heat pump chillers and the primary (source) side of the system's plate-and-frame heat exchanger. The heat exchanger and the chilled/heating water pumping systems will be located within the first floor mechanical room. Chilled/heating water pumps will be provided with N+1 redundancy such that the operation of the building can be maintained in the event of a single pump failure. In addition, these pumping systems will be equipped with variable frequency drives for use during system balancing. Major chilled/heating water infrastructure components, including the chilled/heating water pumps, a plate-and-frame heat exchanger, a glycol feeder, an air separator, an expansion tank, and a buffer tank will also be located within the first floor mechanical room.

> Heat Pump Loop Side of Heat Exchanger: Two base-mounted heat pump loop distribution pumps (one active and one stand-by) will circulate an all-water fluid between the secondary (load) side of the plate-and-frame heat exchanger and the water-source heat pump units located throughout the building. Heat pump loop distribution pumping systems will also be located within the first floor mechanical room and be provided with N+1 redundancy such that the operation of the building can be maintained in the event of a single pump failure. In addition, these pumping systems will be equipped with variable frequency drives for reduced energy consumption during periods of reduced system demand. Major heat pump loop infrastructure components, including the heat pump loop distribution pumps, a plate-and-frame heat exchanger (described previously), an air separator, and an expansion tank will also be located within the first floor mechanical room.

General Classroom HVAC Systems

Extended range vertical heat pump units will be provided for space conditioning within the general classroom areas, with these units located within mechanical closets positioned near the area served. Doors for all mechanical closets will be accessed from the corridor for routine maintenance. Heat pump units will generally be equipped with two-stage type compressors, helping to extend compressor life and improve the overall energy efficiency of these systems under part load operation.

A series of outdoor, roof mounted DOAS units with supply and exhaust fans, enthalpy wheels for pre-conditioning outdoor air, DX heat pump coils with water-cooled compressors, and hot gas reheat coils for tempering supply air will be provided to deliver conditioned ventilation airflow to the classroom areas served. Airflow supplied from these DOAS units will be dehumidified, conditioned, and delivered to each space directly. Exhaust airflow from classrooms, restrooms, and storage room areas will be routed through each DOAS unit's enthalpy wheel for pre-conditioning of outdoor air.

The use of demand control ventilation within the classroom areas will be provided to assist with reducing the school's overall energy consumption. To accomplish this control strategy, a series of VAV retrofit-type air terminal units will be installed within the conditioned outdoor air ductwork systems. Each classroom will be provided with a dedicated VAV air terminal unit, regulating the quantity of conditioned outdoor air delivered to each space based on the actual room carbon dioxide levels.

<u>Music and Art Classroom HVAC Systems</u>

The music and art classroom areas will be provided with a similar HVAC system approach as the general classroom areas. This HVAC system approach includes extended range vertical heat pump units for space conditioning, DOAS units for ventilation, and demand control ventilation via VAV retrofit-type air terminal units. Heat pump units will continue to be positioned within mechanical closets, with supply and return air ductwork extending from these units to the area served.

<u>Administration, Guidance, and Health Suite HVAC Systems</u>

The administration, guidance, and administrative support areas will be provided with space conditioning through a dedicated variable refrigerant flow (VRF) system. This system will be complete with heat recovery type water-cooled condensing units connected to the heat pump loop. Condensing units will be located within mechanical rooms near the spaces served. Doors to mechanical rooms will be accessible from the corridor for routine maintenance.

The use of ceiling cassette type VRF terminal units is anticipated, promoting sufficient clearance access for filter replacement. Multi-occupant spaces will be provided with 3'x3' cassettes with high efficiency (MERV 10 or higher) disposable filters. Single occupant spaces will be provided with 2'x2' cassettes with the VRF manufacturer's standard washable filter.

A dedicated DOAS unit with supply and exhaust fans, an enthalpy wheel for pre-conditioning outdoor air, a hot gas reheat coil for tempering supply air, and a DX heat pump coil with water-cooled compressors will be provided to deliver conditioned ventilation airflow to the administration areas served. Airflow supplied from this DOAS unit will be dehumidified, conditioned, and delivered directly to each space. Exhaust airflow from the offices, restrooms, and storage room areas will be routed through the DOAS unit's enthalpy wheel for pre-conditioning of outdoor air.

<u>Media Center HVAC System</u>

An extended range large capacity vertical heat pump unit will be provided for space conditioning within the media center area. This heat pump unit will be similar to those provided for the school's general classroom areas; however, also provided with multiple compressors and hot-gas reheat to accomplish room level humidity control. This heat pump unit will be positioned with a mechanical room located adjacent to the media center. Conditioned ventilation air for the media center will be provided by the classroom DOAS units described previously.

<u>Gymnasium HVAC Systems</u>

An indoor air handling unit with heat pump type water-cooled compressor, and hot gas reheat coil will provide space conditioning and ventilation for the gymnasium area. The water-cooled compressors will be connected to the heat pump loop. Full airside economizer and enthalpy wheel energy recovery devices will be provided where required by the International Energy Conservation Code. Demand control ventilation will be provided for the units serving the Gymnasium. This air handling unit will be positioned within a mechanical room located adjacent to the gymnasium space

Cafe/Multi-Purpose Room HVAC Systems

An indoor air handling unit with heat pump type water-cooled compressor, and hot gas reheat coil will provide space conditioning and ventilation for the cafe/multipurpose room. The water-cooled compressor will be connected to the heat pump loop. Full airside economizer and enthalpy wheel energy recovery devices will be provided where required by the International Energy Conservation Code. Demand control ventilation will be provided for the units serving the Cafe/Multipurpose Room. This air handling unit will be located within a mechanical room located adjacent to the multipurpose room space.

Kitchen HVAC Systems

An indoor air handling unit with heat pump type water-cooled compressor, and hot gas reheat coil will provide space conditioning and ventilation for the kitchen. The air handling unit will be located within the penthouse mechanical room and the water-cooled compressor will be connected to the heat pump loop. Full airside economizer and enthalpy wheel energy recovery devices will be provided where required by the International Energy Conservation Code. General exhaust from the kitchen restroom, storage rooms, and the kitchen space itself will be routed to a rooftop exhaust fan. A separate rooftop exhaust fan will also be provided for serving the kitchen's associated exhaust hood.

Pool Area HVAC Systems

Space conditioning and ventilation for the pool will be provided by a pair of indoor single-zone variable air volume, heat pump type, air-handling units. The heat pump units will be air-source with split condensing units located on the roof of the pool area. The air handling unit will be positioned inside the mechanical room adjacent to the pool area. Auxiliary heating will be provided by two new hydronic duct heating coils. Heating water will be generated by an air-source, heat pump type, water heater. A new inline pump, expansion tank, and air separator will be provided for the heating water system. A new heat exchanger and pool water pump will also be provided with a pool water circuit piped to the air handling units and heat exchanger for pool water heating.

Miscellaneous Building Areas

Data, Telecomm, and Elevator Room will be served by ductless split systems. Heating-only type spaces such as mechanical rooms, electrical rooms, stairs, storage rooms, and entry vestibules will be provided with electric cabinet and propeller unit heaters. In addition, a dedicated switch-operated exhaust fan will also be provided within the health suite area and within the administration workroom.

Building Automation Control System

Automatic temperature controls will be direct digital type controls (DDC). Actuation will be electric / electronic for all systems. All system components will be installed in accordance with MCPS standards and networked to the existing front-end server located at the MCPS Energy Management Office.

PLUMBING SYSTEMS

Domestic Water Piping Systems (Including Water Service Entrance)

A new combination fire/water service will enter the school within the first floor mechanical room. The new combination fire/water service will be capable of supporting both the fire and water service demands of the school. A new domestic water service, complete with basket strainer and backflow preventer will separate the domestic water and fire services prior to distributing water throughout the school. Domestic water piping will be distributed from this first floor mechanical room area to plumbing fixtures and equipment located throughout the school. The existing domestic water piping will be replaced throughout the entire school.

Domestic Hot Water Heater System

Domestic hot water for the proposed replacement school concept will be generated by a pair of electric resistance tank type domestic water heaters. Domestic hot water will be generated at 140-degrees F, with 120-degrees F domestic hot water distributed throughout the school. Local thermostatic mixing valves will reduce the water temperature to 110-degrees F at hand washing fixtures. The piping loop will be complete with a dedicated hot water circulation pump and expansion tank.

Storm Water Piping Systems

Storm water drainage, including roof drains, overflow drains, and storm water piping systems will be replaced to the greatest extent possible throughout the entire school. Above- and below-grade storm water piping will be constructed from PVC material. All storm water piping systems will exit the school at various locations and coordinate with available site piping connections provided for the proposed replacement school option.

Roof drains with interior storm water piping are anticipated for flat roof areas. Roof gutters with exterior downspouts are anticipated for sloped roof areas. Cast iron storm water leader shoes will be provided where downspouts transition to below grade storm water piping before connecting to the site storm water system.

Sanitary and Vent Piping Systems

Sanitary waste and vent piping systems will be replaced to the greatest extent possible throughout the entire school. Above- and below-grade sanitary and vent piping will be constructed from PVC material. Vent piping will terminate at the roof level, with a minimum 25-foot separation provided between vent piping terminations and any outdoor air intake locations. Sanitary piping systems will exit the building at various locations and will coordinate with the available site piping connections provided for the proposed replacement school option.

The following special sanitary and vent piping systems are anticipated:

- Equipment and sinks that may discharge grease into the sanitary system from the kitchen will be piped to a new underground concrete grease interceptor. The discharge from this interceptor will be connected to site sanitary piping system.
- Sinks within the art classrooms will be provided with solids interceptors, collecting debris and preventing it from entering the site sanitary piping system.

Plumbing Fixtures

The school's existing plumbing fixtures will be replaced under Option 4a. Institutional grade replacement plumbing fixtures will be provided that include floor-mounted water closets utilizing 1.28 gallon per flush valves, pint flush (0.125 gallon per flush) wall-hung urinals, and wall-hung lavatories with hot and cold water faucets with low flow aerators. The water consumption figures noted are equal to or less than what is required by the current plumbing code and for promoting good water conservation practices. All new plumbing fixtures will be ADA compliant.

Gas Piping Systems

The existing Piney Branch ES indoor natural gas service, associated meter, and interior gas piping will be replaced to accommodate the proposed replacement school scope of work. A new natural gas service will be provided by Washington Gas for the school. The gas service meter and pressure reducing station will be positioned outdoors and located near the main mechanical room. Gas piping will serve the emergency generator only.

FIRE PROTECTION SYSTEMS

Sprinkler System

The entire building will be fully sprinklered, with the sprinkler system separated into several zones that will match the fire alarm pull zones for the building. The existing sprinkler heads and associated branch sprinkler piping will be removed and replaced throughout the school, with new sprinkler piping extending from the new combination fire/water service entering the school within the first floor mechanical room.

A fire flow test will be performed during the early stages of design to confirm the available municipal water pressure and determine if a fire pump is required to support the proposed sprinkler system. A fire pump is not currently anticipated based on the available water pressure at the existing school. All work will be specified to conform to standards of the National Fire Protection Association (NFPA) and will include requirements for performance verification through hydraulic calculations.

Fire Detection and Alarm System

The existing fire detection and alarm system will be demolished and replaced throughout the entire building.

The fire detection and alarm system will comply with State of Maryland Fire Code, local authorities having jurisdiction, International Building Code, and NFPA. The fire detection and alarm system will be a stand-alone, addressable, and will have voice evacuation capability. The main fire alarm control panel (FACP) will be located either in the main telecom room or in a location as directed by MCPS. The FACP will be equipped with battery backup. The fire alarm annunciator with graphic display and adjacent keypad will be located at the main building entrance vestibule or lobby.

Initiation devices include manual pull stations, smoke detectors, duct smoke detectors, heat detectors, and carbon monoxide detectors (where gas-fired equipment is used). Notification devices include fire alarm combination speaker/strobe devices, strobes, and fire alarm speakers. The fire detection and alarm system will be connected to the lighting control system to facilitate the automatic illumination of the path of egress upon initiation of the fire alarm system.

ELECTRICAL SYSTEMS

General

The proposed Option #4a – Replacement concept demolishes the existing Piney Branch ES building and constructs a new building with a pool on the existing site. The existing electrical distribution equipment, lighting fixtures, lighting controls, receptacles, voice/data system, public address system, and security system components will be demolished and replaced. A new main electrical room and auxiliary electrical room will be provided within the existing building foot print within the existing main mechanical space. Existing spaces within the school will be renovated in their entirety under the scope of this project option.

The electrical systems will include work associated with power, generator power, lighting, lighting controls, intercom/public address systems. Power provisions will be provided for classroom technology, data, voice, building security (door access control, intrusion detection, video surveillance), and food service. The electrical systems, in concert with the architectural, mechanical, communications, electronic safety and security, and food service considerations, are intended to create spaces that are flexible, functional, energy-efficient and respond to the needs of this facility.

The electrical design will comply with applicable codes, regulations, standards, and authorities having jurisdiction. Sustainable technologies will be incorporated into the design to meet requirements of the Maryland Green Building Council - High-Performance Green Building Program, which requires compliance with either USGBC LEED v4 (minimum LEED Silver certification), GBI Green Globes (minimum two Green Globes), or Maryland Green Building Council-adopted version of International Green Construction Code (IgCC).

Electrical Service

A new outdoor Pepco utility transformer will be provided near the new main electrical room. Montgomery County Public School (MCPS) prefers pad-mounted utility transformers over the existing utility transformer vault, therefore, a pad-mounted utility transformer option will be explored with PEPCO. A secondary service concrete-encased ductbank (with minimum 10 ducts) will be run from the utility transformer to the CT section of the new main switchboard in the new main electrical room.

Power Distribution

The new main electrical room will consist of the new main switchboard, dry-type transformer(s), distribution panelboard, lighting panelboard, and branch circuit panelboards.

A separate "auxiliary" electrical room will be provided within the new main electrical room for new generator-connected equipment. Generator-connected equipment will consist of enclosed switches, automatic transfer switches, dry-type transformers, and panelboards.

The new main switchboard will be connected to Pepco utility power, will be rated at 2,000 amperes, 277/480 volts, 3-phase, 4-wire, will incorporate ground fault protection and surge protection, and will have a CT section, a tap section for connection of future on-site photovoltaic (PV) system, main section with 2,000-ampere main circuit breaker, and distribution section(s) with molded-case feeder circuit breakers. The main switchboard will serve mechanical loads and panelboards, lighting panelboards, and general receptacle branch circuit panelboards (via step-down transformers) in the main electrical room and electrical closets throughout the school. The main switchboard will be sized with spare capacity and space for future circuit breakers in order to accommodate any future renovations to the school.

The Maryland Emergency Management Agency (MEMA) may designate Piney Branch ES as an emergency public shelter. Electrical equipment for the MEMA emergency public shelter will include a 3,000-ampere outdoor generator docking station or outdoor quick-connect generator switchboard, with multiple cam-lock connectors per phase, in order to connect a temporary portable generator to the main switchboard. An additional main section with 3,000A main circuit breaker will be required at the main switchboard and connected to the outdoor generator docking station or outdoor quick-connect generator switchboard. The main circuit breakers of the switchboard will be key-interlocked so that only one main circuit breaker can be "closed" at a time to prevent simultaneous closure. The gymnasium / multi-purpose room, cafetorium / multi-purpose room, food service, and corridors connecting these spaces will be designated by MEMA to be used as an emergency public shelter, with the electrical loads and mechanical equipment supporting these spaces to be operational when connected to a temporary portable generator. MCPS may request MEMA for a waiver to not designate Piney Branch ES as an emergency public shelter.

Panelboards will be rated at 277/480 volts and 120/208 volts and serve as distribution, lighting, or branch circuit panels. There will be dedicated panelboards for lighting, mechanical loads, and receptacle plug loads. Panelboards will have a copper bus structure. Panelboards will be sized with approximately 25 percent spare capacity and 25 percent spare breaker space. A three-phase surge protective device (SPD) will be mounted adjacent to each respective emergency (life-safety) panel, lighting panel, and receptacle / plug load branch circuit panel. Panelboard circuit directories will be typed. 120/208-volt panelboards will be located such that branch circuit wiring is not run over 150 feet, to avoid long distances and increased wire sizes due to voltage drop.

The typical dry-type transformer will be general-purpose, energy-efficient type, complying with DOE 2016, and will have a 480-volt delta primary, and 208/120-volt, three-phase, four-wire, wye secondary.

Lighting will be connected at 277 volts, single-phase. Mechanical equipment will be connected at either 120 volts, single-phase; 208 volts, single-phase; 208 volts, 3-phase; 277 volts, single-phase; or 480 volts, 3 phase, depending upon the load requirements. Motors one horsepower or larger will be connected at 480 volts, 3-phase. General receptacles will be connected at 120 volts, single-phase. Each feeder and branch circuit will have a separate copper grounding conductor in the same raceway.

Rigid galvanized steel (RGS) conduit will be used in the first five feet of underground conduit extending outside of the building, under roads and paved areas where existing pavement is not to be disturbed, and for elbows penetrating floor slabs, exterior walls, or bearing walls. Intermediate metal conduit (IMC) will be used for wiring to exterior equipment. Electrical metallic tubing (EMT) will be used in interior spaces, except where RGS is required. Polyvinylchloride (PVC) conduit will be used for underground feeders and circuits, except where RGS is required. Flexible metal conduit (FMC) will be used to connect to transformers. Liquid-tight flexible metal conduit (LFMC) will be used to connect to motors and other vibrating equipment. FMC and LFMC will be limited to a maximum 6-foot length. The minimum size conduit will be 3/4 inches.

The wiring system will be copper conductors with THHN/THWN-2 insulation. MCPS allows the use of aluminum feeders for feeders 100 amperes (#2 AWG) and larger. For branch circuit wiring, Type MC cable will be allowed to be installed in concealed ceiling spaces, drywall partitions, and casework within instructional spaces. EMT conduit will be used in rooms with open ceilings, in masonry partitions, and masonry walls.

Receptacle branch circuits will utilize #12 wiring when the run is 50 linear feet or less, #10 wiring when the run is more between 50 and 100 linear feet, and #8 wiring when the run is over 100 linear feet.

Tamper-resistant receptacles will be provided throughout to meet NEC requirements for educational facilities. Convenience receptacles will be provided throughout, including multiple locations within classrooms, including at teacher's desk, teacher's wardrobe, and "computer cart" charging station. Receptacle device plates will be labeled with circuit designations. Overhead cord reels with receptacle connections may be provided in technology education spaces.

Switched / controlled receptacles will be provided to meet the IECC requirement that at least 50% of 120-volt 20-ampere receptacles in classrooms, private offices, conference rooms, work rooms, and staff break room. Switched / controlled receptacles will be connected to the lighting controls system and controlled by occupancy sensor(s) in respective room.

Electrical provisions will be made for electric vehicle (EV) charging stations in the parking lot.

<u>Solar Photovoltaic</u>

Electrical provisions will be made for a future solar photovoltaic (PV) system in order for the school to be solar PV ready. These provisions will include a dedicated tap section for PV system connection at the main switchboard and underground raceways for PV canopies. Raceways for PV system components located on the roof will be provided by the PV System Installer.

<u>Generator Power</u>

There will be an onsite outdoor natural-gas generator with weatherproof, sound-attenuated enclosure, sized to accommodate emergency / life-safety and standby loads via automatic transfer switches. The generator will be rated at 277/480 volts, 3-phase, 4-wire. The estimated size for the generator is 150 kW. The basis-of-design generator manufacturer will be Rehlko (formerly Kohler) Power Systems.

Enclosed circuit breakers mounted at the generator will serve automatic transfer switches located in the "auxiliary" electrical room within the main electrical room. The first automatic transfer switch (ATS) will be for emergency / life safety loads and will connect to emergency panelboard(s). Emergency panelboard(s) will provide power to emergency egress lighting in corridors and instructional spaces, and exit signs. The second ATS will be the "standby" ATS and will connect to standby panelboards.

Standby panelboards will serve data/voice communications equipment in telecom rooms, automatic temperature control (ATC) / building management system control panels, kitchen cooler/freezer, refrigerator in health suite, intercom/public address equipment, security equipment, fire detection and alarm equipment, heaters/heat trace for rooftop equipment and outdoor piping, elevator cab, sump pumps, and other equipment and devices as determined by MCPS. The "standby" ATS will also serve selected receptacles in the principal's office, main office, health suite, corridors, gymnasium, cafeteria, kitchen, and classrooms.

Article 700 Emergency Systems, Section 700.3(F) of the NEC requires a generator docking station to be provided on the emergency / life-safety power distribution system to allow for connecting to a temporary portable generator when the permanent on-site generator needs maintenance or repair. The generator docking station will be connected between the emergency output circuit breaker of the on-site generator and the emergency automatic transfer switch. The generator docking station will have provisions to connect to a load bank via cam lock connectors. The generator docking station will be sized to accommodate the entire generator load and will be located at the building exterior adjacent to the generator.

Overcurrent devices are required by the NEC to be "selectively coordinated" from the generator down to the branch circuit overcurrent devices on the emergency / life-safety panelboard(s). The NEC requires selective coordination on the "full range of overcurrent protective device opening times associated with those overcurrents". In order to meet this requirement, fuse-type panelboards will be utilized for emergency / life safety panelboards. Spare fuse cabinet with 25% spare fuses will be located next to fuse-type panelboards.

<u>Lighting</u>

Luminaires (lighting fixtures) will utilize LED light sources. LED luminaires in corridors, classrooms, instructional spaces, offices, workrooms, seminar rooms, storage rooms, group toilet rooms, and rooms with lay-in ceilings will be recessed 2' x 2' or 2' x 4' LED luminaires. Recessed LED downlights will be used where smaller luminaires are appropriate. High abuse wall-mounted LED luminaires will be used in stairwells. LED strip luminaires will be used in support spaces with open ceilings. High-bay "UFO" style luminaires will be provided in the gymnasium. Architectural LED luminaires will be provided in the main vestibule, main lobby, media center, and cafetorium / multi-purpose room.

For specialty pendant-mounted lighting in high ceilings, remote drivers will not be located in high ceiling spaces. LED tunable white lighting fixtures will be provided in special education instructional spaces. Emergency lighting and exit signs with red lettering will be provided where required. Exit signs will be LED type.

Exterior full-cutoff dark-sky compliant LED building-mounted luminaires will be provided. Exterior luminaires will include building-mounted luminaires around the perimeter of the building, and pole-mounted luminaires for parking, drop-off, and bus loop. Luminaires will be located so as not to exceed the maximum lighting levels beyond the property line. The finish of exterior luminaires will be selected by the Architect.

The lighting design will comply with 2021 International Energy Conservation Code (IECC) and Maryland Green Building Council - High Performance Green Building Program. Lighting power density (LPD) will not exceed 0.61 watts per square foot, which is 15% better than 0.72 watts per square foot for a school building in the IECC. The selection of lighting fixtures for the building will be compliant with the energy code.

Lighting levels will be designed in accordance with the recommendations of the Illuminating Engineering Society (IES). Maintained illumination values will be calculated using a total maintenance factor of 90 percent. Classrooms will have an average between 30 and 50 foot-candles at the task plane. The correlate color temperature (CCT) rating will be 3500 Kelvin for interior luminaires and 3000 Kelvin for exterior luminaires per MCPS requirements.

Lighting Controls

Switching of luminaires will have ON/OFF and RAISE/LOWER lighting level capability in regularly occupied spaces and will be zoned as appropriate for larger spaces. Occupancy sensors will be utilized for automatic control of both interior and exterior lighting. In addition, an astronomic time switch / time clock will be used to turn ON/OFF exterior lighting if needed.

Lighting controls in classrooms and instructional spaces will include a dedicated lighting load relay controller (to be located in accessible ceiling space near respective entrance/egress door), low-voltage lighting control stations, and ceiling occupancy sensor(s).

Luminaires in each classroom and instructional space will be on one zone controlled by local lighting control stations. The lighting control station located at each entrance/egress door will provide ON/OFF capability. The lighting control station located at the teacher station will provide ON/OFF and RAISE/LOWER lighting level capability. Luminaires will be turned-on at a 50% lighting level. Additional lighting control stations will be provided per MCPS requirements.

One luminaire in each classroom will also be connected to an emergency lighting circuit (via UL 924 relay or generator transfer device) and will be automatically switched ON during a power outage.

Occupancy sensors in classrooms, other instructional spaces, offices, workrooms, seminar rooms, and storage rooms will be set to "vacancy" mode, meaning that lighting in these spaces will need to be manually turned ON via local lighting control wall station. Occupancy sensors in group toilet rooms, individual toilet rooms, vestibules, corridors, and stairwells will be set to "occupancy" mode, meaning that lighting in these spaces will be automatically turned ON when occupied.

Automatic daylight controls (daylight photocell/sensor that automatically dims lighting when there is sufficient daylight in a space) for daylight harvesting will be utilized only where required per 2021 International Energy Conservation Code (IECC). Daylight harvesting will be required in rooms where there is more than 150 watts of general lighting within a sidelight or toplight daylight zones.

In compliance with 2021 NFPA 101 (Life Safety Code), Sections 7.8.1.2.2, 7.8.1.2.3 and A.7.8.1.2.3, where occupancy sensors are used to control lighting fixtures within the means of egress (corridors, stairs), lighting fixtures will automatically be illuminated to full output upon activation of the building fire alarm system.

In order to meet 2021 IECC, Section C405.2.7.3, for lighting setback, each exterior building-mounted luminaire will have an integral occupancy sensor to dim lighting to 50 percent lighting level when occupancy is not detected for 5 minutes.

Lightning Protection

Lightning protection will not be provided. Building systems will be protected from lightning-induced currents and transients by surge protective devices (SPD's) at the main switchboard, generator emergency / life-safety panelboards (per NEC), generator standby panelboards, lighting panelboards, and receptacle branch circuit panelboards. If the grounding system is installed and connected correctly (to ground ring, to building steel, to cold water pipes, and to structural footer), the SPD's will work properly to protect equipment.

Public Address System:

Intercommunications/public address system devices will include speakers and call switches. Stand-alone sound reinforcement systems will be provided in the multipurpose room, main gymnasium, auxiliary gym, dance rooms, and music rooms per MCPS standards.

Security System:

Security systems will include door access control (card readers), intrusion detection (keypads and motion detectors), and video surveillance (cameras). Distributed antenna system will be provided for public safety radio for first responders.

Technology Infrastructure:

The school will have communications (data and voice) systems including wireless access points throughout for Wi-Fi. Provisions for audio/visual systems for instructional technology will be provided.

OPTION 4b - REPLACEMENT SCHOOL CONCEPT

MECHANICAL SYSTEMS

General

The proposed Option #4b - Replacement School Concept (without pool) includes demolition of the existing school and construction of a new onsite building.

A geothermal heat pump system, with a the wellfield located under the parking lot area or the adjacent park area, will be investigated further during design. At this time a geothermal system does not appear feasible due to limited site area.

The proposed mechanical, plumbing, and fire protection systems are identical to the systems proposed for Option 4a except the pool systems will not be provided.

ELECTRICAL SYSTEMS

General

The proposed Option #4b – Replacement concept demolishes the existing Piney Branch ES building and constructs a new building without a pool on the existing site. The existing electrical distribution equipment, lighting fixtures, lighting controls, receptacles, voice/data system, public address system, and security system components will be demolished and replaced. A new main electrical room and auxiliary electrical room will be provided within the existing building foot print within the existing main mechanical space. Existing spaces within the school will be renovated in their entirety under the scope of this project option.

The electrical systems will include work associated with power, generator power, lighting, lighting controls, intercom/public address systems. Power provisions will be provided for classroom technology, data, voice, building security (door access control, intrusion detection, video surveillance), and food service. The electrical systems, in concert with the architectural, mechanical, communications, electronic safety and security, and food service considerations, are intended to create spaces that are flexible, functional, energy-efficient and respond to the needs of this facility.

The electrical design will comply with applicable codes, regulations, standards, and authorities having jurisdiction. Sustainable technologies will be incorporated into the design to meet requirements of the Maryland Green Building Council - High-Performance Green Building Program, which requires compliance with either USGBC LEED v4 (minimum LEED Silver certification), GBI Green Globes (minimum two Green Globes), or Maryland Green Building Council-adopted version of International Green Construction Code (IgCC).

Electrical Service

A new outdoor Pepco utility transformer will be provided near the new main electrical room. Montgomery County Public School (MCPS) prefers pad-mounted utility transformers over the existing utility transformer vault, therefore, a pad-mounted utility transformer option will be explored with PEPCO. A secondary service concrete-encased ductbank (with minimum 10 ducts) will be run from the utility transformer to the CT section of the new main switchboard in the new main electrical room.

Power Distribution

The new main electrical room will consist of the new main switchboard, dry-type transformer(s), distribution panelboard, lighting panelboard, and branch circuit panelboards.

A separate "auxiliary" electrical room will be provided within the new main electrical room for new generator-connected equipment. Generator-connected equipment will consist of enclosed switches, automatic transfer switches, dry-type transformers, and panelboards.

The new main switchboard will be connected to Pepco utility power, will be rated at 2,000 amperes, 277/480 volts, 3-phase, 4-wire, will incorporate ground fault protection and surge protection, and will have a CT section, a tap section for connection of future on-site photovoltaic (PV) system, main section with 2,000-ampere main circuit breaker, and distribution section(s) with molded-case feeder circuit breakers. The main switchboard will serve mechanical loads and panelboards, lighting panelboards, and general receptacle branch circuit panelboards (via step-down transformers) in the main electrical room and electrical closets throughout the school. The main switchboard will be sized with spare capacity and space for future circuit breakers in order to accommodate any future renovations to the school.

The Maryland Emergency Management Agency (MEMA) may designate Piney Branch ES as an emergency public shelter. Electrical equipment for the MEMA emergency public shelter will include a 3,000-ampere outdoor generator docking station or outdoor quick-connect generator switchboard, with multiple cam-lock connectors per phase, in order to connect a temporary portable generator to the main switchboard. An additional main section with 3,000A main circuit breaker will be required at the main switchboard and connected to the outdoor generator docking station or outdoor quick-connect generator switchboard. The main circuit breakers of the switchboard will be key-interlocked so that only one main circuit breaker can be "closed" at a time to prevent simultaneous closure. The gymnasium / multi-purpose room, cafetorium / multi-purpose room, food service, and corridors connecting these spaces will be designated by MEMA to be used as an emergency public shelter, with the electrical loads and mechanical equipment supporting these spaces to be operational when connected to a temporary portable generator. MCPS may request MEMA for a waiver to not designate Piney Branch ES as an emergency public shelter.

Panelboards will be rated at 277/480 volts and 120/208 volts and serve as distribution, lighting, or branch circuit panels. There will be dedicated panelboards for lighting, mechanical loads, and receptacle plug loads. Panelboards will have a copper bus structure. Panelboards will be sized with approximately 25 percent spare capacity and 25 percent spare breaker space. A three-phase surge protective device (SPD) will be mounted adjacent to each respective emergency (life-safety) panel, lighting panel, and receptacle / plug load branch circuit panel. Panelboard circuit directories will be typed. 120/208-volt panelboards will be located such that branch circuit wiring is not run over 150 feet, to avoid long distances and increased wire sizes due to voltage drop.

The typical dry-type transformer will be general-purpose, energy-efficient type, complying with DOE 2016, and will have a 480-volt delta primary, and 208/120-volt, three-phase, four-wire, wye secondary.

Lighting will be connected at 277 volts, single-phase. Mechanical equipment will be connected at either 120 volts, single-phase; 208 volts, single-phase; 208 volts, 3-phase; 277 volts, single-phase; or 480 volts, 3 phase, depending upon the load requirements. Motors one horsepower or larger will be connected at 480 volts, 3-phase. General receptacles will be connected at 120 volts, single-phase. Each feeder and branch circuit will have a separate copper grounding conductor in the same raceway.

Rigid galvanized steel (RGS) conduit will be used in the first five feet of underground conduit extending outside of the building, under roads and paved areas where existing pavement is not to be disturbed, and for elbows penetrating floor slabs, exterior walls, or bearing walls. Intermediate metal conduit (IMC) will be used for wiring to exterior equipment. Electrical metallic tubing (EMT) will be used in interior spaces, except where RGS is required. Polyvinylchloride (PVC) conduit will be used for underground feeders and circuits, except where RGS is required. Flexible metal conduit (FMC) will be used to connect to transformers. Liquid-tight flexible metal conduit (LFMC) will be used to connect to motors and other vibrating equipment. FMC and LFMC will be limited to a maximum 6-foot length. The minimum size conduit will be 3/4 inches.

The wiring system will be copper conductors with THHN/THWN-2 insulation. MCPS allows the use of aluminum feeders for feeders 100 amperes (#2 AWG) and larger. For branch circuit wiring, Type MC cable will be allowed to be installed in concealed ceiling spaces, drywall partitions, and casework within instructional spaces. EMT conduit will be used in rooms with open ceilings, in masonry partitions, and masonry walls.

Receptacle branch circuits will utilize #12 wiring when the run is 50 linear feet or less, #10 wiring when the run is more between 50 and 100 linear feet, and #8 wiring when the run is over 100 linear feet.

Tamper-resistant receptacles will be provided throughout to meet NEC requirements for educational facilities. Convenience receptacles will be provided throughout, including multiple locations within classrooms, including at teacher's desk, teacher's wardrobe, and "computer cart" charging station. Receptacle device plates will be labeled with circuit designations. Overhead cord reels with receptacle connections may be provided in technology education spaces.

Switched / controlled receptacles will be provided to meet the IECC requirement that at least 50% of 120-volt 20-ampere receptacles in classrooms, private offices, conference rooms, work rooms, and staff break room. Switched / controlled receptacles will be connected to the lighting controls system and controlled by occupancy sensor(s) in respective room.

Electrical provisions will be made for electric vehicle (EV) charging stations in the parking lot.

<u>Solar Photovoltaic</u>

Electrical provisions will be made for a future solar photovoltaic (PV) system in order for the school to be solar PV ready. These provisions will include a dedicated tap section for PV system connection at the main switchboard and underground raceways for PV canopies. Raceways for PV system components located on the roof will be provided by the PV System Installer.

<u>Generator Power</u>

There will be an onsite outdoor natural-gas generator with weatherproof, sound-attenuated enclosure, sized to accommodate emergency / life-safety and standby loads via automatic transfer switches. The generator will be rated at 277/480 volts, 3-phase, 4-wire. The estimated size for the generator is 150 kW. The basis-of-design generator manufacturer will be Rehlko (formerly Kohler) Power Systems.

Enclosed circuit breakers mounted at the generator will serve automatic transfer switches located in the "auxiliary" electrical room within the main electrical room. The first automatic transfer switch (ATS) will be for emergency / life safety loads and will connect to emergency panelboard(s). Emergency panelboard(s) will provide power to emergency egress lighting in corridors and instructional spaces, and exit signs. The second ATS will be the "standby" ATS and will connect to standby panelboards.

Standby panelboards will serve data/voice communications equipment in telecom rooms, automatic temperature control (ATC) / building management system control panels, kitchen cooler/freezer, refrigerator in health suite, intercom/public address equipment, security equipment, fire detection and alarm equipment, heaters/heat trace for rooftop equipment and outdoor piping, elevator cab, sump pumps, and other equipment and devices as determined by MCPS. The "standby" ATS will also serve selected receptacles in the principal's office, main office, health suite, corridors, gymnasium, cafeteria, kitchen, and classrooms.

Article 700 Emergency Systems, Section 700.3(F) of the NEC requires a generator docking station to be provided on the emergency / life-safety power distribution system to allow for connecting to a temporary portable generator when the permanent on-site generator needs maintenance or repair. The generator docking station will be connected between the emergency output circuit breaker of the on-site generator and the emergency automatic transfer switch. The generator docking station will have provisions to connect to a load bank via cam lock connectors. The generator docking station will be sized to

accommodate the entire generator load and will be located at the building exterior adjacent to the generator.

Overcurrent devices are required by the NEC to be "selectively coordinated" from the generator down to the branch circuit overcurrent devices on the emergency / life-safety panelboard(s). The NEC requires selective coordination on the "full range of overcurrent protective device opening times associated with those overcurrents". In order to meet this requirement, fuse-type panelboards will be utilized for emergency / life safety panelboards. Spare fuse cabinet with 25% spare fuses will be located next to fuse-type panelboards.

Lighting

Luminaires (lighting fixtures) will utilize LED light sources. LED luminaires in corridors, classrooms, instructional spaces, offices, workrooms, seminar rooms, storage rooms, group toilet rooms, and rooms with lay-in ceilings will be recessed 2' x 2' or 2' x 4' LED luminaires. Recessed LED downlights will be used where smaller luminaires are appropriate. High abuse wall-mounted LED luminaires will be used in stairwells. LED strip luminaires will be used in support spaces with open ceilings. High-bay "UFO" style luminaires will be provided in the gymnasium. Architectural LED luminaires will be provided in the main vestibule, main lobby, media center, and cafetorium / multi-purpose room.

For specialty pendant-mounted lighting in high ceilings, remote drivers will not be located in high ceiling spaces. LED tunable white lighting fixtures will be provided in special education instructional spaces. Emergency lighting and exit signs with red lettering will be provided where required. Exit signs will be LED type.

Exterior full-cutoff dark-sky compliant LED building-mounted luminaires will be provided. Exterior luminaires will include building-mounted luminaires around the perimeter of the building, and pole-mounted luminaires for parking, drop-off, and bus loop. Luminaires will be located so as not to exceed the maximum lighting levels beyond the property line. The finish of exterior luminaires will be selected by the Architect.

The lighting design will comply with 2021 International Energy Conservation Code (IECC) and Maryland Green Building Council - High Performance Green Building Program. Lighting power density (LPD) will not exceed 0.61 watts per square foot, which is 15% better than 0.72 watts per square foot for a school building in the IECC. The selection of lighting fixtures for the building will be compliant with the energy code.

Lighting levels will be designed in accordance with the recommendations of the Illuminating Engineering Society (IES). Maintained illumination values will be calculated using a total maintenance factor of 90 percent. Classrooms will have an average between 30 and 50 foot-candles at the task plane. The correlate color temperature (CCT) rating will be 3500 Kelvin for interior luminaires and 3000 Kelvin for exterior luminaires per MCPS requirements.

Lighting Controls

Switching of luminaires will have ON/OFF and RAISE/LOWER lighting level capability in regularly occupied spaces and will be zoned as appropriate for larger spaces. Occupancy sensors will be utilized for automatic control of both interior and exterior lighting. In addition, an astronomic time switch / time clock will be used to turn ON/OFF exterior lighting if needed.

Lighting controls in classrooms and instructional spaces will include a dedicated lighting load relay controller (to be located in accessible ceiling space near respective entrance/egress door), low-voltage lighting control stations, and ceiling occupancy sensor(s).

Luminaires in each classroom and instructional space will be on one zone controlled by local lighting control stations. The lighting control station located at each entrance/egress door will provide ON/OFF

capability. The lighting control station located at the teacher station will provide ON/OFF and RAISE/LOWER lighting level capability. Luminaires will be turned-on at a 50% lighting level. Additional lighting control stations will be provided per MCPS requirements.

One luminaire in each classroom will also be connected to an emergency lighting circuit (via UL 924 relay or generator transfer device) and will be automatically switched ON during a power outage.

Occupancy sensors in classrooms, other instructional spaces, offices, workrooms, seminar rooms, and storage rooms will be set to "vacancy" mode, meaning that lighting in these spaces will need to be manually turned ON via local lighting control wall station. Occupancy sensors in group toilet rooms, individual toilet rooms, vestibules, corridors, and stairwells will be set to "occupancy" mode, meaning that lighting in these spaces will be automatically turned ON when occupied.

Automatic daylight controls (daylight photocell/sensor that automatically dims lighting when there is sufficient daylight in a space) for daylight harvesting will be utilized only where required per 2021 International Energy Conservation Code (IECC). Daylight harvesting will be required in rooms where there is more than 150 watts of general lighting within a sidelight or toplight daylight zones.

In compliance with 2021 NFPA 101 (Life Safety Code), Sections 7.8.1.2.2, 7.8.1.2.3 and A.7.8.1.2.3, where occupancy sensors are used to control lighting fixtures within the means of egress (corridors, stairs), lighting fixtures will automatically be illuminated to full output upon activation of the building fire alarm system.

In order to meet 2021 IECC, Section C405.2.7.3, for lighting setback, each exterior building-mounted luminaire will have an integral occupancy sensor to dim lighting to 50 percent lighting level when occupancy is not detected for 5 minutes.

Lightning Protection

Lightning protection will not be provided. Building systems will be protected from lightning-induced currents and transients by surge protective devices (SPD's) at the main switchboard, generator emergency / life-safety panelboards (per NEC), generator standby panelboards, lighting panelboards, and receptacle branch circuit panelboards. If the grounding system is installed and connected correctly (to ground ring, to building steel, to cold water pipes, and to structural footer), the SPD's will work properly to protect equipment.

Public Address System:

Intercommunications/public address system devices will include speakers and call switches. Stand-alone sound reinforcement systems will be provided in the multipurpose room, main gymnasium, auxiliary gym, dance rooms, and music rooms per MCPS standards.

Security System:

Security systems will include door access control (card readers), intrusion detection (keypads and motion detectors), and video surveillance (cameras). Distributed antenna system will be provided for public safety radio for first responders.

Technology Infrastructure:

The school will have communications (data and voice) systems including wireless access points throughout for Wi-Fi. Provisions for audio/visual systems for instructional technology will be provided.

Building Considerations for all Options

Heating and Cooling Infrastructure Systems

A centralized air-to-water heat pump unit system is recommended to support all proposed renovation, renovation and addition, and replacement school concepts. This type of mechanical system provides the ability to have independent heating or cooling year-round, while delivering an extremely high level of overall building energy efficiency.

Chilled/Heating Water Side of Heat Exchanger: A pair of air-to-water, two-pipe, heat pump chillers will generate either heating water or chilled water for the centralized air-to-water heat pump system. Three base-mounted chilled/heating water pumps (two active and one stand-by) will circulate a propylene glycol-water mixture between the heat pump chillers and the primary (source) side of the system's plate-and-frame heat exchanger. Pumping systems will be equipped with variable frequency drives. Major chilled/heating water infrastructure components, including the chilled/heating water pumps, a plate-and-frame heat exchanger, a glycol feeder, an air separator, an expansion tank, and a buffer tank will also be provided.

Heat Pump Loop Side of Heat Exchanger: Two base-mounted heat pump loop distribution pumps (one active and one stand-by) will circulate an all-water fluid between the secondary (load) side of the plate-and-frame heat exchanger and the water-source heat pump units located throughout the building. Pumping systems will be equipped with variable frequency drives. Major heat pump loop infrastructure components, including the heat pump loop distribution pumps, a plate-and-frame heat exchanger (described previously), an air separator, and an expansion tank will also be provided.

General Classroom HVAC Systems

Extended range vertical heat pump units will be provided for space conditioning within the general classroom areas. Heat pump units will generally be equipped with two-stage type compressors.

A series of indoor or outdoor DOAS units with supply and exhaust fans, enthalpy wheels for pre-conditioning outdoor air, DX heat pump coils with water-cooled compressors, and hot gas reheat coils for tempering supply air will be provided to deliver conditioned ventilation airflow to the classroom areas served.

Each classroom will be provided with a dedicated VAV air terminal unit, regulating the quantity of conditioned outdoor air delivered to each space based on the actual room carbon dioxide levels.

Music and Art Classroom HVAC Systems

The music and art classroom areas will be provided with a similar HVAC system approach as the general classroom areas.

Administration, Guidance, and Health Suite HVAC Systems

The administration, guidance, and administrative support areas will be provided with space conditioning through a dedicated variable refrigerant flow (VRF) system. This system will be complete with heat recovery type water-cooled condensing units connected to the heat pump loop.

The use of ceiling cassette type VRF terminal units is anticipated. Multi-occupant spaces will be provided with 3'x3' cassettes with high efficiency (MERV 10 or higher) disposable filters. Single occupant spaces will be provided with 2'x2' cassettes with the VRF manufacturer's standard washable filter.

A dedicated DOAS unit with supply and exhaust fans, an enthalpy wheel for pre-conditioning outdoor air, a hot gas reheat coil for tempering supply air, and a DX heat pump coil with water-cooled compressors will be provided to deliver conditioned ventilation airflow to the administration areas served.

Media Center HVAC System

An extended range large capacity vertical heat pump unit will be provided for space conditioning within the media center area. This heat pump unit will be similar to those provided for the school's general classroom areas; however, also provided with multiple compressors and hot-gas reheat to accomplish room level humidity control.

Gymnasium HVAC Systems

An indoor air handling unit with heat pump type water-cooled compressor, and hot gas reheat coil will provide space conditioning and ventilation for the gymnasium area. Full airside economizer and enthalpy wheel energy recovery devices will be provided where required by the International Energy Conservation Code.

Cafe/Multi-Purpose Room HVAC Systems

An indoor air handling unit with heat pump type water-cooled compressor, and hot gas reheat coil will provide space conditioning and ventilation for the cafe/multipurpose room. Full airside economizer and enthalpy wheel energy recovery devices will be provided where required by the International Energy Conservation Code.

Kitchen HVAC Systems

An indoor air handling unit with heat pump type water-cooled compressor, and hot gas reheat coil will provide space conditioning and ventilation for the kitchen. Full airside economizer and enthalpy wheel energy recovery devices will be provided where required by the International Energy Conservation Code. General exhaust from the kitchen restroom, storage rooms, and the kitchen space itself will be routed to a rooftop exhaust fan. A separate rooftop exhaust fan will also be provided for serving the kitchen's associated exhaust hood.

Pool Area HVAC Systems (where applicable)

Space conditioning and ventilation for the pool will be provided by a pair of indoor single-zone variable air volume, heat pump type, air-handling units. The heat pump units will be either water source, connected to the buildings heat pump loop, or air-source with split condensing units located on the roof of the pool area. Auxiliary heating will be provided by two new hydronic duct heating coils. Heating water will be generated by a water-source, heat pump type, water heater connected to the buildings heat pump piping loop. A new inline pump, expansion tank, and air separator will be provided for the heating water system. A new heat exchanger and pool water pump will also be provided with a pool water circuit piped to the air handling units and heat exchanger for pool water heating.

Miscellaneous Building Areas

Data, Telecomm, and Elevator Room will be served by ductless split systems. Heating-only type spaces such as mechanical rooms, electrical rooms, stairs, storage rooms, and entry vestibules will be provided with electric cabinet and propeller unit heaters. In addition, a dedicated switch-operated exhaust fan will also be provided within the health suite area and within the administration workroom.

Building Automation Control System

Automatic temperature controls will be direct digital type controls (DDC). Actuation will be electric / electronic for all systems. All system components will be installed in accordance with MCPS standards and networked to the existing front-end server located at the MCPS Energy Management Office.

PLUMBING SYSTEMS

Domestic Water Piping Systems (Including Water Service Entrance)

A new combination fire/water service will enter the school within the first floor mechanical room. The new combination fire/water service will be capable of supporting both the fire and water service demands of the school. A new domestic water service, complete with basket strainer and backflow preventer will separate the domestic water and fire services prior to distributing water throughout the school. Domestic water piping will be distributed from this first floor mechanical room area to plumbing fixtures and equipment located throughout the school. The existing domestic water piping will be replaced throughout the entire school.

Domestic Hot Water Heater System

Domestic hot water will be generated by a pair of electric resistance tank type domestic water heaters. Domestic hot water will be generated at 140-degrees F, with 120-degrees F domestic hot water distributed throughout the school. Local thermostatic mixing valves will reduce the water temperature to 110-degrees F at hand washing fixtures. The piping loop will be complete with a dedicated hot water circulation pump and expansion tank.

Storm Water Piping Systems

Storm water drainage, including roof drains, overflow drains, and storm water piping systems will be replaced to the greatest extent possible throughout the entire school. Above- and below-grade storm water piping will be constructed from PVC material. All storm water piping systems will exit the school at various locations and coordinate with available site piping connections.

Roof drains with interior storm water piping are anticipated for flat roof areas. Roof gutters with exterior downspouts are anticipated for sloped roof areas. Cast iron storm water leader shoes will be provided where downspouts transition to below grade storm water piping before connecting to the site storm water system.

Sanitary and Vent Piping Systems

Sanitary waste and vent piping systems will be replaced to the greatest extent possible throughout the entire school. Above- and below-grade sanitary and vent piping will be constructed from PVC material. Vent piping will terminate at the roof level, with a minimum 25-foot separation provided between vent piping terminations and any outdoor air intake locations. Sanitary piping systems will exit the building at various locations and will coordinate with the available site piping connections.

The following special sanitary and vent piping systems are anticipated:

- •Equipment and sinks that may discharge grease into the sanitary system from the kitchen will be piped to a new underground concrete grease interceptor. The discharge from this interceptor will be connected to site sanitary piping system.
- •Sinks within the art classrooms will be provided with solids interceptors, collecting debris and preventing it from entering the site sanitary piping system.

Plumbing Fixtures

The school's existing plumbing fixtures will be replaced. Institutional grade replacement plumbing fixtures will be provided that include floor-mounted water closets utilizing 1.28 gallon per flush valves, pint flush (0.125 gallon per flush) wall-hung urinals, and wall-hung lavatories with hot and cold water faucets with low flow aerators. The water consumption figures noted are equal to or less than what is required by the current plumbing code and for promoting good water conservation practices. All new plumbing fixtures will be ADA compliant.

Gas Piping Systems

The existing Piney Branch ES indoor natural gas service, associated meter, and interior gas piping will be replaced. A new natural gas service will be provided by Washington Gas for the school. The gas service meter and pressure reducing station will be positioned outdoors and located near the main mechanical room. Gas piping will serve the emergency generator only.

FIRE PROTECTION SYSTEMS

Sprinkler System

The entire building will be fully sprinklered, with the sprinkler system separated into several zones that will match the fire alarm pull zones for the building. The existing sprinkler heads and associated branch sprinkler piping will be removed and replaced throughout the school, with new sprinkler piping extending from the new combination fire/water service entering the school within the first floor mechanical room.

A fire flow test will be performed during the early stages of design to confirm the available municipal water pressure and determine if a fire pump is required to support the proposed sprinkler system. A fire pump is not currently anticipated based on the available water pressure at the existing school. All work will be specified to conform to standards of the National Fire Protection Association (NFPA) and will include requirements for performance verification through hydraulic calculations.

Fire Detection and Alarm System

The existing fire detection and alarm system will be demolished and replaced throughout the entire building.

The fire detection and alarm system will comply with State of Maryland Fire Code, local authorities having jurisdiction, International Building Code, and NFPA. The fire detection and alarm system will be a stand-alone, addressable, and will have voice evacuation capability. The main fire alarm control panel (FACP) will be located either in the main telecom room or in a location as directed by MCPS. The FACP will be equipped with battery backup. The fire alarm annunciator with graphic display and adjacent keypad will be located at the main building entrance vestibule or lobby.

Initiation devices include manual pull stations, smoke detectors, duct smoke detectors, heat detectors, and carbon monoxide detectors (where gas-fired equipment is used). Notification devices include fire alarm combination speaker/strobe devices, strobes, and fire alarm speakers. The fire detection and alarm system will be connected to the lighting control system to facilitate the automatic illumination of the path of egress upon initiation of the fire alarm system.

ELECTRICAL SYSTEMS

General

The existing electrical distribution equipment, lighting fixtures, lighting controls, receptacles, voice/data system, public address system, and security system components serving the existing Piney Branch ES building will be demolished and replaced throughout the entire building.

The electrical systems will include work associated with power, generator power, lighting, lighting controls, and intercom/public address systems. Power provisions will be provided for classroom technology, data, voice, building security (door access control, intrusion detection, video surveillance), and food service. The electrical systems, in concert with the architectural, mechanical, communications, electronic safety and security, and food service considerations, are intended to create spaces that are flexible, functional, energy-efficient and respond to the needs of this facility. The electrical design will comply with applicable codes, regulations, standards, and authorities having jurisdiction. Sustainable technologies will be incorporated into the design to meet requirements of the Maryland Green Building Council - High-Performance Green Building Program, which requires compliance with either USGBC LEED v4 (minimum LEED Silver certification), GBI Green Globes (minimum two Green Globes), or Maryland Green Building Council-adopted version of International Green Construction Code (IgCC).

Electrical Service

A new outdoor pad-mounted Pepco utility transformer will be provided adjacent to the main electrical room. (The front of the utility transformer will be within 20 feet from a vehicular paved road.) A secondary service concrete-encased ductbank (with minimum 10 ducts) will be run from the utility transformer to the CT section of the new main switchboard in the new main electrical room.

Power Distribution

The new main electrical room will consist of the new main switchboard, dry-type transformer(s), distribution panelboard, lighting panelboard, and branch circuit panelboards.

A separate "auxiliary" electrical room will be provided within the new main electrical room for new generator-connected equipment. Generator-connected equipment will consist of enclosed switches, automatic transfer switches, dry-type transformers, and panelboards.

The new main switchboard will be connected to Pepco utility power, will be rated at 2,000 amperes, 277/480 volts, 3-phase, 4-wire, will incorporate ground fault protection and surge protection, and will have a CT section, a tap section for connection of future on-site photovoltaic (PV) system, main section with 2,000-ampere main circuit breaker, and distribution section(s) with molded-case feeder circuit breakers. The main switchboard will serve mechanical loads and panelboards, lighting panelboards, and general receptacle branch circuit panelboards (via step-down transformers) in the main electrical room and electrical closets throughout the school. The main switchboard will be sized with spare capacity and space for future circuit breakers in order to accommodate any future renovations to the school.

The Maryland Emergency Management Agency (MEMA) may designate Piney Branch ES as an emergency public shelter. Electrical equipment for the MEMA emergency public shelter will include a 2,000-ampere outdoor generator docking station or outdoor quick-connect generator switchboard, with multiple cam-lock connectors per phase, in order to connect a temporary portable generator to the main switchboard. An additional main section with 2,000A main circuit breaker will be required at the main switchboard and connected to the outdoor generator docking station or outdoor quick-connect generator switchboard. The main circuit breakers of the switchboard will be key-interlocked so that only one main circuit breaker can be "closed" at a time to prevent simultaneous closure. The gymnasium / multi-purpose room, cafetorium / multi-purpose room, food service, and corridors connecting these spaces will be designated by MEMA to be used as an emergency public shelter, with the electrical loads and mechanical equipment supporting these spaces to be operational when connected to a temporary portable generator. MCPS may request MEMA for a waiver to not designate Piney Branch ES as an emergency public shelter.

Panelboards will be rated at 277/480 volts and 120/208 volts and serve as distribution, lighting, or branch circuit panels. There will be dedicated panelboards for lighting, mechanical loads, and receptacle plug loads. Panelboards will have a copper bus structure. Panelboards will be sized with approximately 25 percent spare capacity and 25 percent spare breaker space. A three-phase surge protective device (SPD) will be mounted adjacent to each respective emergency (life-safety) panel, lighting panel, and receptacle / plug load branch circuit panel. Panelboard circuit directories will be typed. 120/208-volt panelboards will be located such that branch circuit wiring is not run over 150 feet, to avoid long distances and increased wire sizes due to voltage drop.

The typical dry-type transformer will be general-purpose, energy-efficient type, complying with DOE 2016, and will have a 480-volt delta primary, and 208/120-volt, three-phase, four-wire, wye secondary.

Lighting will be connected at 277 volts, single-phase. Mechanical equipment will be connected at either 120 volts, single-phase; 208 volts, single-phase; 208 volts, 3-phase; 277 volts, single-phase; or 480 volts, 3 phase, depending upon the load requirements. Motors one horsepower or larger will be connected at 480 volts, 3-phase. General receptacles will be connected at 120 volts, single-phase. Each feeder and branch circuit will have a separate copper grounding conductor in the same raceway.

Rigid galvanized steel (RGS) conduit will be used in the first five feet of underground conduit extending outside of the building, under roads and paved areas where existing pavement is not to be disturbed, and for elbows penetrating floor slabs, exterior walls, or bearing walls. Intermediate metal conduit (IMC) will be used for wiring to exterior equipment. Electrical metallic tubing (EMT) will be used in interior spaces, except where RGS is required. Polyvinylchloride (PVC) conduit will be used for underground feeders and circuits, except where RGS is required. Flexible metal conduit (FMC) will be used to connect to transformers. Liquid-tight flexible metal conduit (LFMC) will be used to connect to motors and other vibrating equipment. FMC and LFMC will be limited to a maximum 6-foot length. The minimum size conduit will be 3/4 inches.

The wiring system will be copper conductors with THHN/THWN-2 insulation. MCPS allows the use of aluminum feeders for feeders 100 amperes (#2 AWG) and larger. For branch circuit wiring, Type MC cable will be allowed to be installed in concealed ceiling spaces, drywall partitions, and casework within instructional spaces. EMT conduit will be used in rooms with open ceilings, in masonry partitions, and masonry walls.

Receptacle branch circuits will utilize #12 wiring when the run is 50 linear feet or less, #10 wiring when the run is more between 50 and 100 linear feet, and #8 wiring when the run is over 100 linear feet.

Tamper-resistant receptacles will be provided throughout to meet NEC requirements for educational facilities. Convenience receptacles will be provided throughout, including multiple locations within classrooms, including at teacher's desk, teacher's wardrobe, and "computer cart" charging station. Receptacle device plates will be labeled with circuit designations. Overhead cord reels with receptacle connections may be provided in technology education spaces.

Switched / controlled receptacles will be provided to meet the IECC requirement that at least 50% of 120-volt 20-ampere receptacles in classrooms, private offices, conference rooms, work rooms, and staff break room. Switched / controlled receptacles will be connected to the lighting controls system and controlled by occupancy sensor(s) in respective room.

Electrical provisions will be made for electric vehicle (EV) charging stations in the parking lot.

Solar Photovoltaic

Electrical provisions will be made for a future solar photovoltaic (PV) system in order for the school to be solar PV ready. These provisions will include a dedicated tap section for PV system connection at the main switchboard and underground raceways for PV canopies. Raceways for PV system components located on the roof will be provided by the PV System Installer.

Generator Power

There will be an onsite outdoor natural-gas generator with weatherproof, sound-attenuated enclosure, sized to accommodate emergency / life-safety and standby loads via automatic transfer switches. The generator will be rated at 277/480 volts, 3-phase, 4-wire. The estimated size for the generator is 150 kW. The basis-of-design generator manufacturer will be Rehlko (formerly Kohler) Power Systems.

Enclosed circuit breakers mounted at the generator will serve automatic transfer switches located in the "auxiliary" electrical room within the main electrical room. The first automatic transfer switch (ATS) will be for emergency / life safety loads and will connect to emergency panelboard(s). Emergency panelboard(s) will provide power to emergency egress lighting in corridors and instructional spaces, and exit signs. The second ATS will be the "standby" ATS and will connect to standby panelboards. Standby panelboards will serve data/voice communications equipment in telecom rooms, automatic temperature control (ATC) / building management system control panels, kitchen cooler/freezer, refrigerator in health suite, intercom/public address equipment, security equipment, fire detection and alarm equipment, heaters/heat trace for rooftop equipment and outdoor piping, elevator cab, sump pumps, and other equipment and devices as determined by

MCPS. The “standby” ATS will also serve selected receptacles in the principal’s office, main office, health suite, corridors, gymnasium, cafeteria, kitchen, and classrooms.

Article 700 Emergency Systems, Section 700.3(F) of the NEC requires a generator docking station to be provided on the emergency / life-safety power distribution system to allow for connecting to a temporary portable generator when the permanent on-site generator needs maintenance or repair. The generator docking station will be connected between the emergency output circuit breaker of the on-site generator and the emergency automatic transfer switch. The generator docking station will have provisions to connect to a load bank via cam lock connectors. The generator docking station will be sized to accommodate the entire generator load and will be located at the building exterior adjacent to the generator.

Overcurrent devices are required by the NEC to be “selectively coordinated” from the generator down to the branch circuit overcurrent devices on the emergency / life-safety panelboard(s). The NEC requires selective coordination on the “full range of overcurrent protective device opening times associated with those overcurrents”. In order to meet this requirement, fuse-type panelboards will be utilized for emergency / life safety panelboards. Spare fuse cabinet with 25% spare fuses will be located next to fuse-type panelboards.

Lighting

Luminaires (lighting fixtures) will utilize LED light sources. LED luminaires in corridors, classrooms, instructional spaces, offices, workrooms, seminar rooms, storage rooms, group toilet rooms, and rooms with lay-in ceilings will be recessed 2’ x 2’ or 2’ x 4’ LED luminaires. Recessed LED downlights will be used where smaller luminaires are appropriate. High abuse wall-mounted LED luminaires will be used in stairwells. LED strip luminaires will be used in support spaces with open ceilings. High-bay “UFO” style luminaires will be provided in the gymnasium. Architectural LED luminaires will be provided in the main vestibule, main lobby, media center, and cafetorium / multi-purpose room.

For specialty pendant-mounted lighting in high ceilings, remote drivers will not be located in high ceiling spaces. LED tunable white lighting fixtures will be provided in special education instructional spaces. Emergency lighting and exit signs with red lettering will be provided where required. Exit signs will be LED type.

Exterior full-cutoff dark-sky compliant LED building-mounted luminaires will be provided. Exterior luminaires will include building-mounted luminaires around the perimeter of the building, and pole-mounted luminaires for parking, drop-off, and bus loop. Luminaires will be located so as not to exceed the maximum lighting levels beyond the property line. The finish of exterior luminaires will be selected by the Architect.

The lighting design will comply with 2021 International Energy Conservation Code (IECC) and Maryland Green Building Council - High Performance Green Building Program. Lighting power density (LPD) will not exceed 0.61 watts per square foot, which is 15% better than 0.72 watts per square foot for a school building in the IECC. The selection of lighting fixtures for the building will be compliant with the energy code.

Lighting levels will be designed in accordance with the recommendations of the Illuminating Engineering Society (IES). Maintained illumination values will be calculated using a total maintenance factor of 90 percent. Classrooms will have an average between 30 and 50 foot-candles at the task plane. The correlate color temperature (CCT) rating will be 3500 Kelvin for interior luminaires and 3000 Kelvin for exterior luminaires per MCPS requirements.

Lighting Controls

Switching of luminaires will have ON/OFF and RAISE/LOWER lighting level capability in regularly occupied spaces and will be zoned as appropriate for larger spaces. Occupancy sensors will be utilized for automatic control of both interior and exterior lighting. In addition, an astronomic time switch / time clock will be used to turn ON/OFF exterior lighting if needed.

Lighting controls in classrooms and instructional spaces will include a dedicated lighting load relay controller (to be located in accessible ceiling space near respective entrance/egress door), low-voltage lighting control stations, and ceiling occupancy sensor(s).

Luminaires in each classroom and instructional space will be on one zone controlled by local lighting control stations. The lighting control station located at each entrance/egress door will provide ON/OFF capability. The lighting control station located at the teacher station will provide ON/OFF and RAISE/LOWER lighting level capability. Luminaires will be turned-on at a 50% lighting level. Additional lighting control stations will be provided per MCPS requirements.

One luminaire in each classroom will also be connected to an emergency lighting circuit (via UL 924 relay or generator transfer device) and will be automatically switched ON during a power outage.

Occupancy sensors in classrooms, other instructional spaces, offices, workrooms, seminar rooms, and storage rooms will be set to “vacancy” mode, meaning that lighting in these spaces will need to be manually turned ON via local lighting control wall station. Occupancy sensors in group toilet rooms, individual toilet rooms, vestibules, corridors, and stairwells will be set to “occupancy” mode, meaning that lighting in these spaces will be automatically turned ON when occupied.

Automatic daylight controls (daylight photocell/sensor that automatically dims lighting when there is sufficient daylight in a space) for daylight harvesting will be utilized only where required per 2021 International Energy Conservation Code (IECC). Daylight harvesting will be required in rooms where there is more than 150 watts of general lighting within a sidelight or toplight daylight zones.

In compliance with 2021 NFPA 101 (Life Safety Code), Sections 7.8.1.2.2, 7.8.1.2.3 and A.7.8.1.2.3, where occupancy sensors are used to control lighting fixtures within the means of egress (corridors, stairs), lighting fixtures will automatically be illuminated to full output upon activation of the building fire alarm system.

In order to meet 2021 IECC, Section C405.2.7.3, for lighting setback, each exterior building-mounted luminaire will have an integral occupancy sensor to dim lighting to 50 percent lighting level when occupancy is not detected for 5 minutes.

Lightning Protection

Lightning protection will not be provided. Building systems will be protected from lightning-induced currents and transients by surge protective devices (SPD’s) at the main switchboard, generator emergency / life-safety panelboards (per NEC), generator standby panelboards, lighting panelboards, and receptacle branch circuit panelboards. If the grounding system is installed and connected correctly (to ground ring, to building steel, to cold water pipes, and to structural footer), the SPD’s will work properly to protect equipment.

Public Address System:

Intercommunications/public address system devices will include speakers and call switches. Stand-alone sound reinforcement systems will be provided in the multipurpose room, main gymnasium, auxiliary gym, dance rooms, and music rooms per MCPS standards.

Security System:

Security systems will include door access control (card readers), intrusion detection (keypads and motion detectors), and video surveillance (cameras). Distributed antenna system will be provided for public safety radio for first responders.

Technology Infrastructure:

The school will have communications (data and voice) systems including wireless access points throughout for Wi-Fi. Provisions for audio/visual systems for instructional technology will be provided.

LANDMARK AQUATIC

June 11, 2025
Revised July 16, 2025

Tom Foley
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RE: Piney Branch Elementary Aquatic Assessment Report
7510 Maple Avenue
Takoma Park, MD 20912

Landmark Aquatic, dba Westport Pools was contracted by the Client (Stantec) to provide the following scope of work in an effort to review existing conditions, provide recommendations for aquatic renovations, pool electrical bonding, pool and deck lighting and furnish detailed recommended actions.

The scope of work commenced on April 15, 2025 with a visual assessment of the swimming pool, deck and filtration, chemical treatment and heating systems equipment by Matt Cappello of Landmark Aquatic, representatives of Stantec and Piney Branch. The summary below details code and federal standard items, requirements and recommendations relating to swimming pools and additional aquatic recommendations based on visual conditions observed.

Existing aquatic plans or as-builts were available for review by Landmark Aquatic. Observations are as detailed below.

Main Pool

The existing pool consists of a 6-lane x 25-yard lap pool with depths ranging from 3.5-ft to 10-ft, and 1-in x 1-in tile finish. Per as-built plans, the perimeter of the pool is 234-lineal feet, the water surface area of the pool is 3,153-square feet and the Main Pool volume is 150,593-gallons with a design filter rate of 418-gpm to meet a 6-hour turnover rate. The current posted filter room placard furnished by Winkler Pool Management, Inc lists the pool volume at 153,090-gallons with a filter rate of 318-gpm providing an 8-hour turnover rate. Underwater lights were not provided. Entry into the pool is by four sets of recessed steps and rails, an ADA access lift and ADA stair entry. A stainless-steel overflow gutter and main drains recirculate water through an open top surge tank located in the pool equipment room below deck. An end-suction pump conveys water from the surge tank through two pressure sand filter tanks back to the pool gutter return system with bypass piping to a shell and tube heat exchanger and sodium hypochlorite sanitizer system. pH buffer observed is muriatic acid without a feed system and a chemical controller. There is an automated water level controller system that feeds potable water to the surge tank. Filter backwash is managed by the filter pump that conveys water to the adjacent backwash tank that sends wastewater to the sewer.

Summary Report

Items listed should be addressed and are listed in the aquatic renovation item list.

Code & Standard Review

Virginia Graeme Baker Pool and Spa Safety Act (**VGB**) is a federal standard and refers to suction entrapment prevention from a pool main drain system, overflow system and any other item relating to direct suction from the pool to the respective filter or feature pump. Per the United States Code of Federal Register, The Virginia Graeme Baker Pool and Spa Act (VGBA, or Act) requires that drain covers must comply with entrapment protection requirements specified by the joint American Society of Mechanical Engineers (ASME) and American National Standards Institute (ANSI) ASME/ANSI A112.19.8 performance standard, or any successor standard. The Consumer Product Safety Commission incorporates sections of APSP-16 2017 as the successor drain cover standard.

Americans with Disability Act Accessibility Guidelines (**ADAAG**) is also a federal standard which in this report refers to access into a swimming pool. The Department of Justice published revised final regulations implementing the Americans with Disabilities Act (ADA) for Title II (State and local government services) and Title III (public accommodations and commercial facilities) on September 15, 2010, in the Federal Register. These requirements, or rules, clarify and refine issues that have arisen over the past 20 years and contain new, and updated, requirements, including the 2010 Standards for Accessible Design ("2010 Standards").

Current health code relating to swimming pools follows the Department of Health and Mental Hygiene Code of Maryland Regulations 10.17.01-2013 – Public Swimming Pools and Spas (**COMAR)** and will be referred to as (**Health Code**).

Current electrical code relating to swimming pools follows the 2017 National Electrical Code (**NEC**). NEC Article 680.26 will be discussed in this report and outlines the requirements for equipotential bonding around swimming pools, spas, and similar installations to reduce voltage gradients and minimize the risk of electric shock.

Main Pool

This pool is currently operating as a direct suction system from the gutters and main drain to the surge tank from dual main drains with domed covers with maximum flow rate capable of handling this pool's turnover rate, therefore pool is in compliance with VGB.

Based on the size of this pool, only one primary means of ADA access is required. A lift and approved stair entry was observed at the Main Pool for a primary and secondary means of ADA access. The pool is in compliance with ADAAG for public accommodation.

The pool length and width were measured by tape at the deep end for conformance to nationally recognized standards for starting blocks and compared to the depths as shown on the deck markings. Based on our measurements, the pool is deep enough to support starting blocks.

The pool and deck did not show signs of differential settlement and the elevation of the pool waterline was observed to provide consistent flow of water over the stainless-steel gutter lip (handhold). Differential

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settlement of the pool relative to the adjacent deck and/or cracking of the tile grout are signs of water loss eroding away the subsurface fill layer supporting the concrete.

The pool tile finish of tile did not exhibit signs of delamination or broken tiles. There was one location at the pool floor observed that exhibited signs of corrosion at the grout line and onto the tile. This may be a result of a steel item falling into the pool and staining the localized area or cracking of the concrete and grout layer below and the reinforcing corroding and bleeding through the grout. Draining of the pool, demo of 1' x 1' tile and grout section, concrete crack remediation and replacement of tile and grout is listed in the aquatic renovation list.

The pool gutter was observed to be in fair condition with slight corrosion at the waterline handhold in a few areas. Moderate corrosion staining at the pool rails, stanchions and guard chairs observed. Cleaning stainless steel is a maintenance item but is listed in the aquatic renovation list.

The pool deck was observed to be in compliance with code regarding quantity of drains. The deck sloping to drains observed but should be verified that there is no puddling in any areas when cleaning the tile. The pool deck tile was observed to have several locations of replacement at locations of previously installed equipment, cracks at several grout lines and missing tiles. Deck tile replacement and/or repair listed in the aquatic renovation list.

The were no pool underwater lights observed but overhead lighting was observed to be sufficient to clearly view the bottom of the pool floor at the deep end and at the main drains. An Electrical Engineer should perform a photometric study of the pool deck to confirm overhead lighting is sufficient to achieve 20-foot-candles on the pool deck, water surface and within the pool equipment room. One overhead light fixture was not operational and should be replaced as part of routine maintenance.

The pool recirculation flow rate is compliant with Health Code based on the observed flow meter at 425-gpm. Based on the as-built plan pool volume of 150,593-gallons and a code minimum turnover rate of 8-hours, a minimum flow rate of 314-gpm is required. International Swimming Pool and Spa Code and many State Codes require a 6-hour turnover (419-gpm) and is recommended for this pool.

The surge tank which balances pool water from the main drains and overflow gutter is sized per current International Swimming Pool and Spa Code. Health Code does not list a required size of surge tank. If the Main Pool filtration pump is switched off (or shuts down) the water level in the surge tank will equalize with the pool and overflow into the 6-in drain pipe and to backwash waste tank, causing substantial water loss in the pool (over 100,000-gallons). The surge tank walls can be extended up to the deck above pool operating water level and access hatch on deck added for entry into the tank or a concrete lid can be installed over the existing tank with a vent pipe extending above the pool operating water level. Surge tank modifications is included in the aquatic renovation list.

There is a 15-hp filter pump adjacent to the surge tank. Based on pump curve and typical expected pressure drop across a filtration system, this pump is capable of meeting the required Code flow rate to meet the turnover. The pump and strainer are heavily corroded and appear to be near the end of their useful life and should be replaced and noted in the aquatic renovation list.

There were two horizontal pressure sand filters observed and sized to meet Health Code. The filters appear to be near the end of their useful life and should be replaced and noted in the aquatic renovation list.

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The pool shell and tube heat exchanger was observed to be heavily corroded and appears to be near the end of its useful life and should be replaced and noted in the aquatic renovation list.

The pool liquid chlorine storage tank and pump were observed to provide the sanitizing agent for the pool water. Pool water pH buffering product (muriatic acid) observed on site, but feed pump observed or an automated water chemistry controller and feed system observed. New chemical feeders and automated water chemistry controller is noted in the aquatic renovation list. Due to the observed condition of the piping, hangers and other metallic equipment in the room, separation of the chemical tanks and feed equipment with the main equipment area and proper ventilation is recommended and listed in the aquatic renovation list. Although not currently provided, a supplemental pool water sanitizer system, such as medium-pressure UV to kill waterborne bacteria and viruses while minimizing the off-gassing of chlorine (chloramines) is recommended. In minimizing the chloramines in an indoor pool environment, this supplemental pool water sanitizer helps prevent eye and lung irritation as well as corrosion of steel.

Pool process piping and hangers observed to be severely corroded and should be replaced is listed in the aquatic renovation list.

The automated pool fill system was observed to be functional and could be reused with renovations to the piping and surge tank.

Pool Bonding Assessment

The pool was observed to have continuous bonding wire at the pool filtration equipment. Recommend confirmation of connection of bonding wire from the pool stainless steel gutter, railing anchors and all metallic items within 5-ft of the pool to the pool filtration equipment meeting NEC Article 680. An Electrician should be retained to confirm that the metallic components within 5-feet of the respective pool wall and aquatic filtration equipment are properly bonded with continuity tests showing resistance readings of less than 1-ohm. An improperly bonded pool creates a safety hazard for electrical shock and greater potential for corrosion in pool metallic items.

Should you have any questions, please do not hesitate to contact us.

Sincerely,

Matt Cappello

Matt Cappello, PE
Director of Aquatic Design
Landmark Aquatic-Westport Pools
(314) 743-4831
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Attachments:

- Recommended Aquatic Renovation Items
- Photo Log

AQUATIC RENOVATION ITEM LIST

Item Description	
1	Demo and replace pool floor tile at corroded area. Remediate any cracks in pool concrete.
2	Cleaning of stainless steel gutter and rails / equipment corrosion staining.
3	Replace pool deck tile.
4	Provide photometric study of pool and deck.
5	Renovate surge tank to prevent water loss.
6	Replace pool filter pump and strainer.
7	Replace pool heater.
8	Replace / install new pool water sanitizer, pH buffer and automated water chemistry controller. Recommend installation of supplemental pool water sanitizing system.
9	Install new chemical rooms within equipment room and provide ventilation.
10	Replace all pool piping and hangers/supports.
11	Confirm electrical bonding of pool and filtration equipment.

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Aquatic Report Photo Log
Piney Branch Elementary School ■ Takoma Park, MD 20912
Date Photos Taken: April 15, 2025

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Photo #1 View of pool from shallow end entry onto pool deck from locker rooms and deck drains.

Photo #2 View of pool deep end and starting blocks.

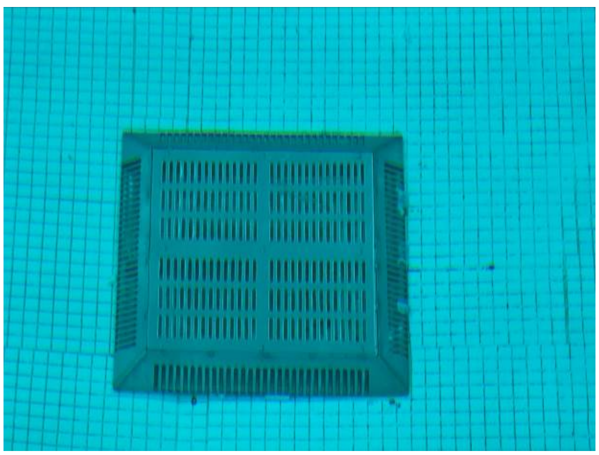

Photo #3 View of pool main drain cover and tile finish.

Photo #4 View of pool stainless steel gutter staining and tile finish.

Photo #5 View of pool stainless steel gutter, tile finish and recessed steps.

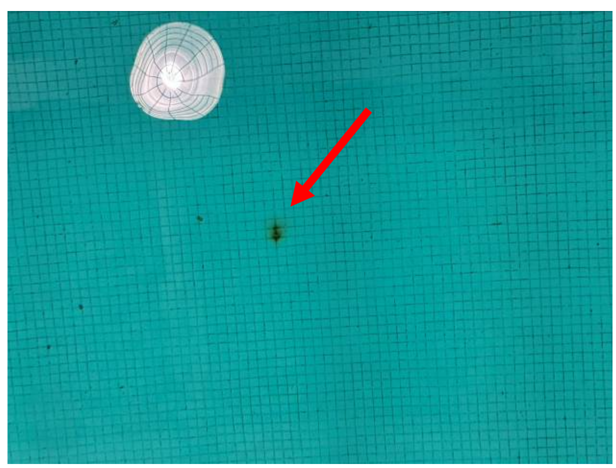

Photo #6 View corrosion stain at pool floor tile.

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Photo #7 View of pool ADA access lift and tip and roll bleacher.

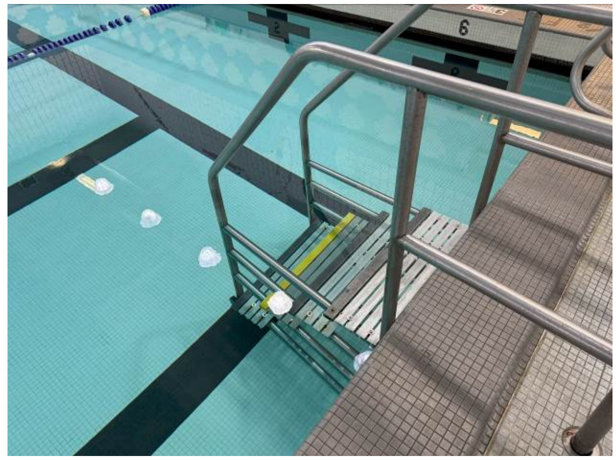

Photo #8 View of pool ADA access stair entry.

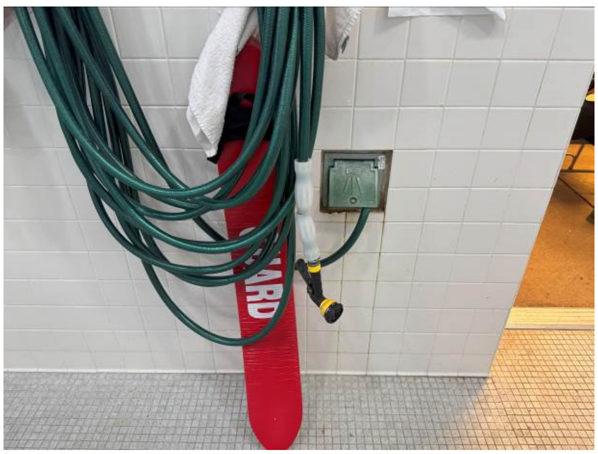

Photo #9 View of deck hose bib and rescue tube.

Photo #10 View water fountain and entry onto pool deck from locker rooms.

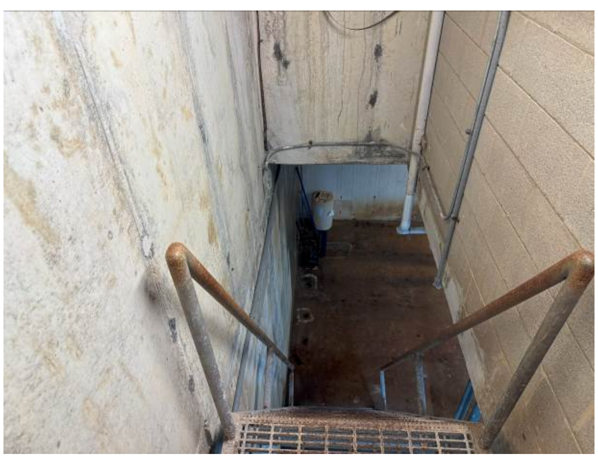

Photo #11 View of entry into pool equipment room below deck level.

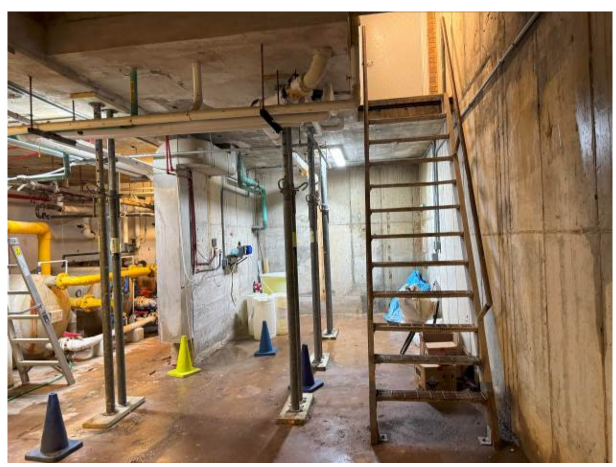

Photo #12 View of pool equipment room and stair access from pool deck level.

Photo #13 View of pool chlorine tanks and feed pump.

Photo #14 View of pool muriatic acid pH buffering product.

Photo #15 View of pool pump, piping and valves.

Photo #16 View of pool filters and backwash tank.

Photo #17 View of pool heat exchanger and piping.

Photo #18 View of pool equipment room sump and drain system.

Photo #19 View of domestic water backflow preventer and backwash tank.

Photo #20 View of pool automated domestic water control panel.

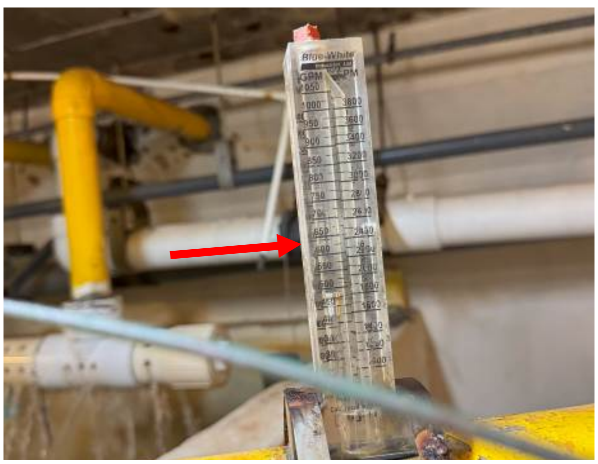

Photo #21 View of pool flow meter reading 425-gpm.

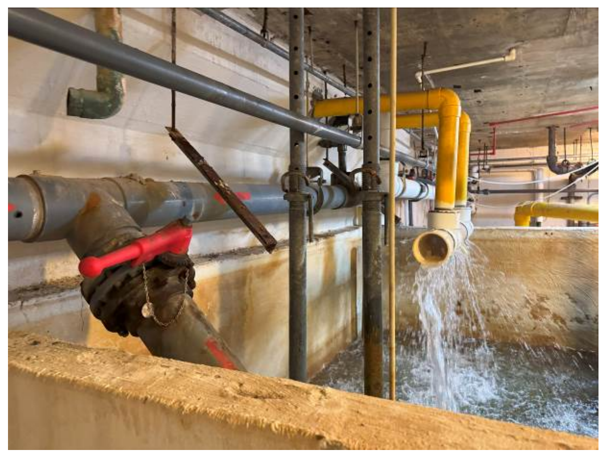

Photo #22 View of pool surge tank and gutter piping.

Photo #23 View of pool main drain piping into surge tank.

Photo #24 View of pool surge tank suction piping to pump.

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June 24, 2025

Tom Foley
Associate, Senior Project Architect
Stantec
1500 Spring Garden Suite 1100
Philadelphia PA 19130-4067

Telephone (General): 215 751-2995
Email: Tom.Foley@stantec.com

RE: Piney Branch Elementary Aquatic Narrative
7510 Maple Avenue
Takoma Park, MD 20912

Landmark Aquatic, dba Westport Pools was contracted by the Client (Stantec) to provide the following scope of work in an effort to review existing conditions, provide recommendations for aquatic renovations, pool electrical bonding, pool and deck lighting and furnish detailed recommended actions.

The scope of work commenced on April 15, 2025 with a visual assessment of the swimming pool, deck and filtration, chemical treatment and heating systems equipment by Matt Cappello of Landmark Aquatic, representatives of Stantec and Piney Branch. The summary below details code and federal standard items, requirements and recommendations relating to swimming pools and additional aquatic recommendations based on visual conditions observed.

Existing aquatic plans or as-builts were available for review by Landmark Aquatic. Observations and existing conditions report with recommendations per the previously issued report. The aquatic narrative for the four options to be presented by Stantec are detailed below.

Options 1-3: Maintaining Existing Pool and Renovating Filtration and Chemical Treatment Equipment

Draining of the pool, demo of 1' x 1' tile and grout section, concrete crack remediation and replacement of tile and grout to remediate corrosion in pool floor tile grout.

Cleaning pool gutter, entry rails, stanchion posts and guard chairs stainless steel.

Demo all exposed pool piping, filter pump, VFD, strainer, filters, heat exchanger, chlorine feed pump in equipment room.

Install new filter pump, strainer pot and baskets, pressure sand filters, heat exchanger, pool chlorine and muriatic acid feed pumps, chemical controller, UV treatment system, schedule 80 PVC and CPVC piping, and flow meters. Reconnect existing water level controller and potable fill system within surge tank.

Extend the surge tank walls up to the deck above pool operating water level with vent pipe and add access hatch on deck with ladder rungs or entry into the tank. Coat interior surfaces with concrete waterproofing membrane.

Install two new chemical CMU block rooms within existing equipment area with ventilation and corrosion resistant doors, frames and hardware.

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Provide electrical bonding of pool and equipment per NEC Article 680.

Option 4

Demo existing pool and equipment. Install 6-lane x 25-yard pool with depths ranging from 3'-6" to 12' for accommodating one-meter springboard diving. Pool and equipment to provide the following.

- Stainless steel gutter overflow system with concrete surge tank.
- Pebble Fina or equal pool finish with tile trim for lane lines, wall targets, depth markers /warning signage and stair / step nosing.
- ADA access lift, stair and step entries meeting health code requirements.
- Six starting blocks, two one-meter diving springboard stands, stanchion posts, backstroke / false start flags for competitive meets.
- Pool deck, maintenance, safety and loose equipment meeting health code requirements.
- Pool filtration pump, strainer, baskets and VFD.
- Pressure sand filters.
- Pool water heat exchanger.
- Pool chlorine and muriatic acid feed pumps with automated chemical controller.
- Pool water UV treatment system.
- Pool automated potable water level controller system.
- Schedule 80 PVC and CPVC piping with flow meters.

Should you have any questions, please do not hesitate to contact us.

Sincerely,

Matt Cappello

Matt Cappello, PE
Director of Aquatic Design
Landmark Aquatic-Westport Pools
(314) 743-4831
mcappello@landmarkaquatic.com

Pool Considerations for all “A” Options

Options 1-3: Maintaining Existing Pool and Renovating Filtration and Chemical Treatment Equipment

Draining of the pool, demo of 1’ x 1’ tile and grout section, concrete crack remediation and replacement of tile and grout to remediate corrosion in pool floor tile grout.

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Demo all exposed pool piping, filter pump, VFD, strainer, filters, heat exchanger, chlorine feed pump in equipment room.

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Install two new chemical CMU block rooms within existing equipment area with ventilation and corrosion resistant doors, frames and hardware.

Provide electrical bonding of pool and equipment per NEC Article 680.

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- ADA access lift, stair and step entries meeting health code requirements.
- Six starting blocks, two one-meter diving springboard stands, stanchion posts, backstroke / false start flags for competitive meets.
- Pool deck, maintenance, safety and loose equipment meeting health code requirements.
- Pool filtration pump, strainer, baskets and VFD.
- Pressure sand filters.
- Pool water heat exchanger.
- Pool chlorine and muriatic acid feed pumps with automated chemical controller.
- Pool water UV treatment system.
- Pool automated potable water level controller system.
- Schedule 80 PVC and CPVC piping with flow meters.

Appendix D

30-Year Operation and Maintenance Analysis Documentation

Energy Model Output Report

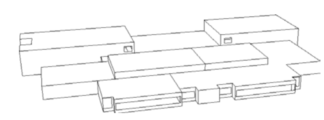
INTEGRATED ENVIRONMENTAL SOLUTIONS

Project:	Piney Branch ES - Option 1A		**Design Team:**	JPA
Address:	7510 Maple Ave, Takoma Park, MD 20912		**Energy Analyst:**	JPA
Climate File:	Baltimore_TMY2.fwt		**Owner:**	MCPS
Simulation:	Piney Branch ES - Option 1A.aps		**Conditioned Area (ft²):**	92325.5000

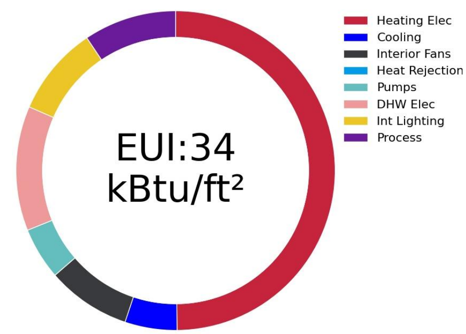
Annual Energy Consumption (kBtu/ft²/year) & CO2 KgCO2/ft²/yr

Energy End Use	Site Energy	Source Energy	CO2 Emissions
Heating Fossil Fuel	0.0	0.0	0.0
Heating Electricity	17.0	26.8	0.8
Space Cooling	1.8	2.6	0.1
Fans Interior	2.9	4.5	0.1
Heat Rejection	0.0	0.0	0.0
Pumps	1.8	2.8	0.1
DHW Fossil Fuel	0.0	0.0	0.0
DHW Electricity	4.3	6.5	0.2
Interior Lighting	3.1	4.7	0.1
Exterior Lighting	0.0	0.0	0.0
Receptacle	0.0	0.0	0.0
Data Center	0.0	0.0	0.0
Cooking Fossil Fuel	0.0	0.0	0.0
Cooking Electricity	0.0	0.0	0.0
Elevators & Escalators	0.0	0.0	0.0
Refrigeration	0.0	0.0	0.0
Process	3.2	4.9	0.1
TOTAL (ex renewables)	**34**	**52**	**1**

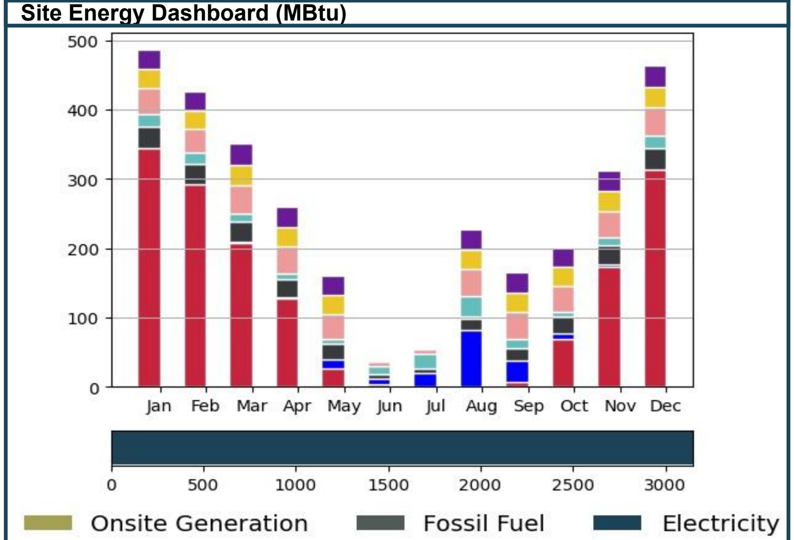
Project Viewer - 3D Model



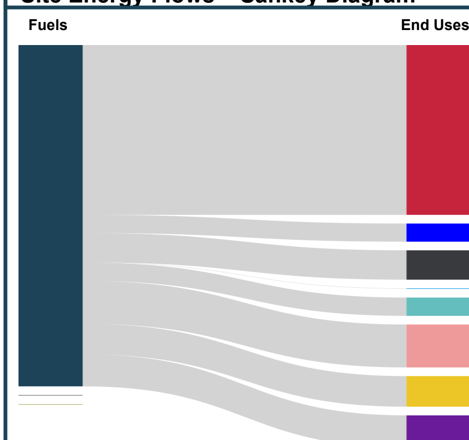
Site Energy Use Intensity



Site Energy Dashboard (MBtu)



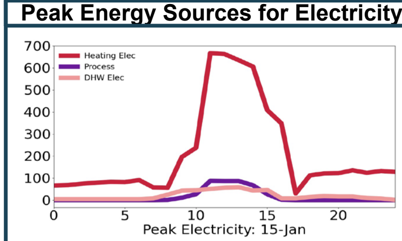
Site Energy Flows – Sankey Diagram

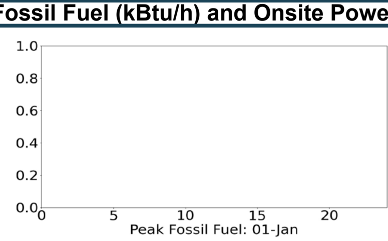


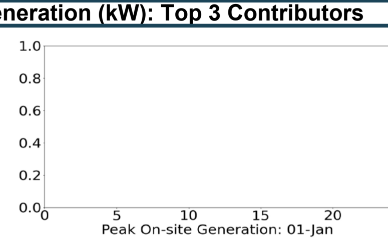
Annual Fuel Costs and Peak Demands

Fuels	Cost ($)	Peak Day	Peak Time	Peak Demand
Electricity	147,668.00	15-Jan	11:00	896.0 kW
Fossil Fuel	0.00	01-Jan	0:00	0.0 kBtu/h
Total	147,668.00	01-Jan	0:00	

Peak Energy Sources for Electricity (kW), Fossil Fuel (kBtu/h) and Onsite Power Generation (kW): Top 3 Contributors







MAINTENANCE AND OPERATION COST ESTIMATE   OPTION 1A

A. OPERATION

	Systems	Quantity	Units	Total Cost
1	Two-pipe Chilled/Heating Water System	92326	SQUARE FOOT	$2,770
2	Four-pipe Chilled Water and Heating Water System	0	SQUARE FOOT	$0
3	Heat Pump System	0	SQUARE FOOT	$0
4	Condenser Water System	0	TON	$0

Total Service Cost	$2,770

B. MAINTENANCE - REPAIR

	Equipment	Quantity	Total Cost
1	Chiller, Air Cooled, Reciprocating; Repair air cooled chiller, 100 ton	2	$15,295
2	Water Cooled Condenser; Repair condenser, water cooled, 15 ton	8	$3,299
3	Fan Coil, DX Air Conditioner, Cooling Only; Repair fan coil, DX 3 ton	93	$15,700
4	Multi-Zone Air Conditioner; Repair multi-zone rooftop unit, 40 ton	4	$18,591
5	Single Zone Variable Volume; Repair single zone variable volume, 20 ton	4	$12,223
6			
7			
8			
9			
10			

Subtotal	$65,109

C. MAINTENANCE - FILTERS

	Equipment	Quantity	Total Cost
1	Particulate Air Filtration, Supported Type, 1"	93	$16,875
2	Particulate Air Filtration, Supported Type, 2"	16	$5,806
3	Particulate Air Filtration, Supported Type, 4"	8	$5,806
4	Particulate Air Filtration, Supported Type, 12"	0	$0

Subtotal	$28,488

D. MAINTENANCE - PREVENTATIVE MAINTENANCE

	Equipment	Quantity	Total Cost
1	Chiller, Recip., Air Cooled	2	$1,699
2	Condensing Unit, Water Cooled	4	$482
3	Condensing Unit, Water Cooled	4	$1,154
4	Air Handling Unit	4	$1,013
5	Air Handling Unit	4	$1,311
6	Fan Coil Unit	93	$22,675
7	Pump, Centifugal	6	$405
8	Controls	1	$272
9			
10			

Subtotal	$29,010
Total Maintenance Cost	$122,607

ONE TIME OPERATIONS COSTS ESTIMATE **OPTION 1A**

A. EXISTING[1]

Estimated Remaining Equipment Life	0 Yrs
Below the Line Costs Multiplier[2,3]	0.00
Subtotal HVAC Equipment Cost	$0.00
Total HVAC Equipment Cost	$0.00
Single Payment (P/F) Present Worth	**$0.00**

B. RENOVATION

Estimated Equipment Life	16 Yrs
Below the Line Costs Multiplier[2,3]	1.55
Subtotal HVAC Cost[2]	$8,785,852.04
Total HVAC Cost	$13,652,709.81
Subtotal HVAC Equipment Cost[2]	$3,141,124.72
Total HVAC Equipment Cost	$4,881,127.53
Single Payment (P/F) Present Worth	**$6,785,326.29**

C. ADDITION

Estimated Equipment Life	16 Yrs
Below the Line Costs Multiplier[2,3]	0.00
Subtotal HVAC Cost[2]	$0.00
Total HVAC Cost	$0.00
Subtotal HVAC Equipment Cost[2]	$0.00
Total HVAC Equipment Cost	$0.00
Single Payment (P/F) Present Worth	**$0.00**

D. NEW CONSTRUCTION

Estimated Equipment Life	16 Yrs
Below the Line Costs Multiplier[2,3]	0.00
Subtotal HVAC Cost[2]	$0.00
Total HVAC Cost	$0.00
Subtotal HVAC Equipment Cost[2]	$0.00
Total HVAC Equipment Cost	$0.00
Single Payment (P/F) Present Worth	**$0.00**

Total Cost **$6,785,326**

Notes:
1. HVAC equipment not replaced as part of scope of work
2. Values from or calculated based on cost estimate
3. Below the Line Costs include general conditions, overhead & profit, bonds & insurance, prevailing wage requirement, design contingency, and esclation

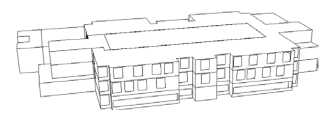
Energy Model Output Report

Project:	Pnei Branch ES - Option 1B		**Design Team:**	JPA
Address:	7510 Maple Avenue, Takoma Park, MD 2091…		**Energy Analyst:**	JPA
Climate File:	Baltimore_TMY2.fwt		**Owner:**	MCPS
Simulation:	Piney Branch ES - Option 1B.aps		**Conditioned Area (ft²):**	92325.5000

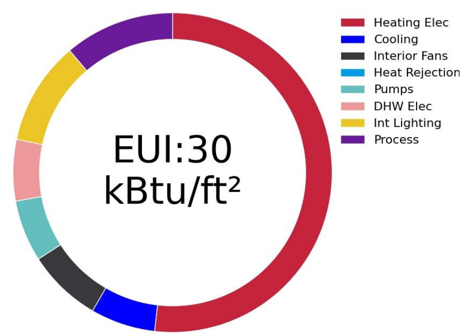
Annual Energy Consumption (kBtu/ft²/year) & CO2 KgCO2/ft²/yr

Energy End Use	Site Energy	Source Energy	CO2 Emissions
Heating Fossil Fuel	0.0	0.0	0.0
Heating Electricity	15.8	25.0	0.7
Space Cooling	2.0	2.8	0.1
Fans Interior	2.3	3.6	0.1
Heat Rejection	0.0	0.0	0.0
Pumps	1.9	2.8	0.1
DHW Fossil Fuel	0.0	0.0	0.0
DHW Electricity	1.9	2.9	0.1
Interior Lighting	3.2	4.9	0.1
Exterior Lighting	0.0	0.0	0.0
Receptacle	0.0	0.0	0.0
Data Center	0.0	0.0	0.0
Cooking Fossil Fuel	0.0	0.0	0.0
Cooking Electricity	0.0	0.0	0.0
Elevators & Escalators	0.0	0.0	0.0
Refrigeration	0.0	0.0	0.0
Process	3.4	5.2	0.1
TOTAL (ex renewables)	**30**	**47**	**1**

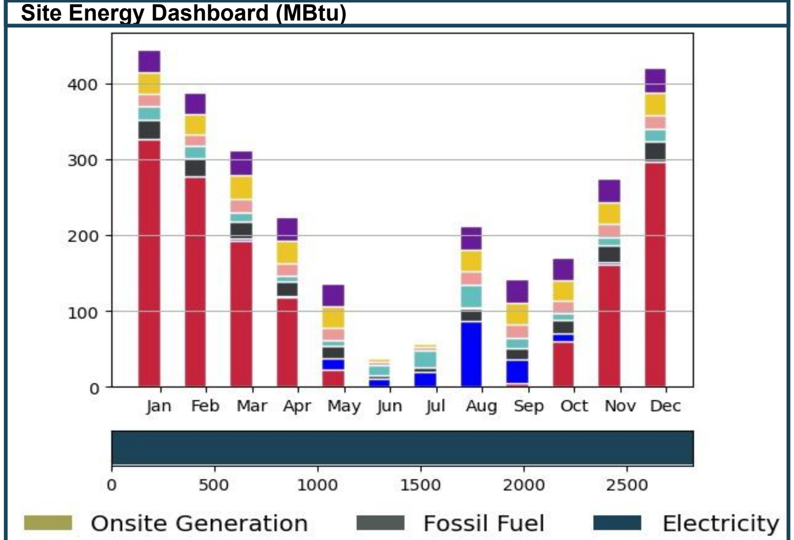
Project Viewer - 3D Model



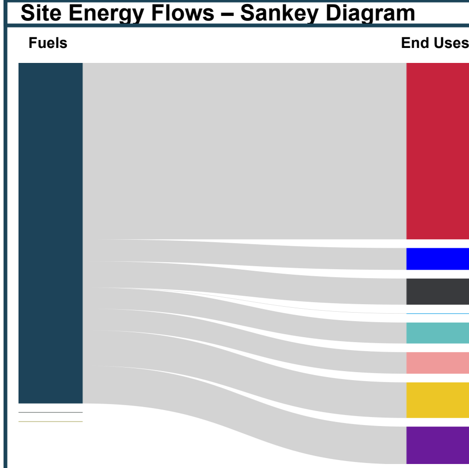
Site Energy Use Intensity



Site Energy Dashboard (MBtu)



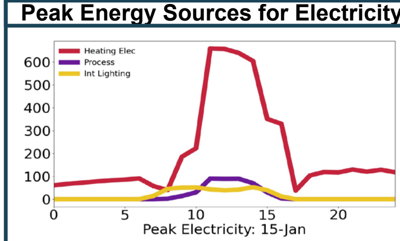
Site Energy Flows – Sankey Diagram

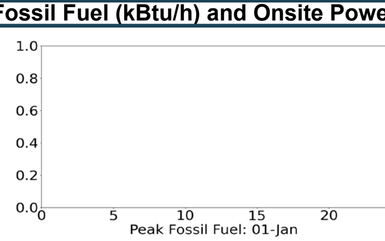


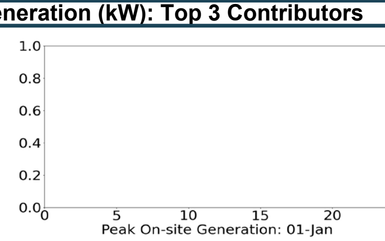
Annual Fuel Costs and Peak Demands

Fuels	Cost ($)	Peak Day	Peak Time	Peak Demand
Electricity	132,216.00	15-Jan	11:00	856.3 kW
Fossil Fuel	0.00	01-Jan	0:00	0.0 kBtu/h
Total	132,216.00	01-Jan	0:00	

Peak Energy Sources for Electricity (kW), Fossil Fuel (kBtu/h) and Onsite Power Generation (kW): Top 3 Contributors







MAINTENANCE AND OPERATION COST ESTIMATE OPTION 1B

A. OPERATION

	Systems	Quantity	Units	Total Cost
1	Two-pipe Chilled/Heating Water System	0	SQUARE FOOT	$0
2	Four-pipe Chilled Water and Heating Water System	0	SQUARE FOOT	$0
3	Heat Pump System	92326	SQUARE FOOT	$2,770
4	Condenser Water System	0	TON	$0

Total Service Cost	$2,770

B. MAINTENANCE - REPAIR

	Equipment	Quantity	Total Cost
1	Chiller, Air Cooled, Reciprocating; Repair air cooled chiller, 100 ton	2	$15,295
2	Water Cooled Condenser; Repair condenser, water cooled, 15 ton	7	$2,887
3	Fan Coil, DX Air Conditioner, Cooling Only; Repair fan coil, DX 3 ton	93	$15,700
4	Multi-Zone Air Conditioner; Repair multi-zone rooftop unit, 40 ton	4	$18,591
5	Single Zone Variable Volume; Repair single zone variable volume, 20 ton	3	$9,167
6			
7			
8			
9			
10			

Subtotal	$61,641

C. MAINTENANCE - FILTERS

	Equipment	Quantity	Total Cost
1	Particulate Air Filtration, Supported Type, 1"	93	$16,875
2	Particulate Air Filtration, Supported Type, 2"	14	$5,081
3	Particulate Air Filtration, Supported Type, 4"	7	$5,081
4	Particulate Air Filtration, Supported Type, 12"	0	$0

Subtotal	$27,036

D. MAINTENANCE - PREVENTATIVE MAINTENANCE

	Equipment	Quantity	Total Cost
1	Chiller, Recip., Air Cooled	2	$1,699
2	Condensing Unit, Water Cooled	3	$361
3	Condensing Unit, Water Cooled	4	$1,154
4	Air Handling Unit	3	$760
5	Air Handling Unit	4	$1,311
6	Fan Coil Unit	93	$22,675
7	Pump, Centifugal	6	$405
8	Controls	1	$272
9			
10			

Subtotal	$28,637

Total Maintenance Cost	$117,314

ONE TIME OPERATIONS COSTS ESTIMATE **OPTION 1B**

A. EXISTING[1]

Estimated Remaining Equipment Life	0 Yrs
Below the Line Costs Multiplier[2,3]	0.00
Subtotal HVAC Equipment Cost	$0.00
Total HVAC Equipment Cost	$0.00
Single Payment (P/F) Present Worth	**$0.00**

B. RENOVATION

Estimated Equipment Life	16 Yrs
Below the Line Costs Multiplier[2,3]	1.56
Subtotal HVAC Cost[2]	$7,937,576.07
Total HVAC Cost	$12,408,882.94
Subtotal HVAC Equipment Cost[2]	$2,823,150.32
Total HVAC Equipment Cost	$4,413,455.89
Single Payment (P/F) Present Worth	**$6,135,209.15**

C. ADDITION

Estimated Equipment Life	16 Yrs
Below the Line Costs Multiplier[2,3]	0.00
Subtotal HVAC Cost[2]	$0.00
Total HVAC Cost	$0.00
Subtotal HVAC Equipment Cost[2]	$0.00
Total HVAC Equipment Cost	$0.00
Single Payment (P/F) Present Worth	**$0.00**

D. NEW CONSTRUCTION

Estimated Equipment Life	16 Yrs
Below the Line Costs Multiplier[2,3]	0.00
Subtotal HVAC Cost[2]	$0.00
Total HVAC Cost	$0.00
Subtotal HVAC Equipment Cost[2]	$0.00
Total HVAC Equipment Cost	$0.00
Single Payment (P/F) Present Worth	**$0.00**

Total Cost **$6,135,209**

Notes:
1. HVAC equipment not replaced as part of scope of work
2. Values from or calculated based on cost estimate
3. Below the Line Costs include general conditions, overhead & profit, bonds & insurance, prevailing wage requirement, design contingency, and esclation

Energy Model Output Report

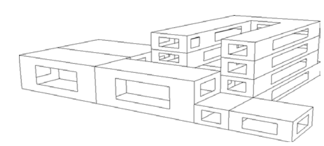
Project:	Piney Branch ES - Option 4A
Address:	7510 Maple Ave, Takoma Park, MD 20912
Climate File:	Baltimore_TMY2.fwt
Simulation:	Piney Branch ES - Option 4A.aps

Design Team:	JPA
Energy Analyst:	JPA
Owner:	MCPS
Conditioned Area (ft²):	77006.5000

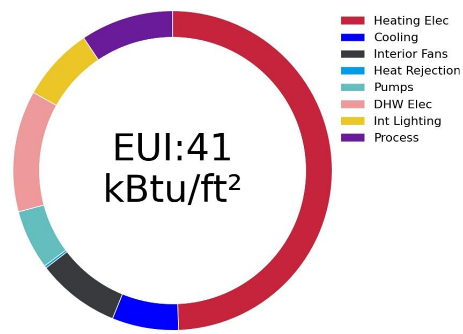
Annual Energy Consumption (kBtu/ft²/year) & CO2 KgCO2/ft²/yr

Energy End Use	Site Energy	Source Energy	CO2 Emissions
Heating Fossil Fuel	0.0	0.0	0.0
Heating Electricity	20.5	32.4	0.9
Space Cooling	2.8	4.1	0.1
Fans Interior	3.5	5.4	0.2
Heat Rejection	0.1	0.1	0.0
Pumps	2.5	3.7	0.1
DHW Fossil Fuel	0.0	0.0	0.0
DHW Electricity	5.1	7.9	0.2
Interior Lighting	3.1	4.8	0.1
Exterior Lighting	0.0	0.0	0.0
Receptacle	0.0	0.0	0.0
Data Center	0.0	0.0	0.0
Cooking Fossil Fuel	0.0	0.0	0.0
Cooking Electricity	0.0	0.0	0.0
Elevators & Escalators	0.0	0.0	0.0
Refrigeration	0.0	0.0	0.0
Process	3.9	5.9	0.2
TOTAL (ex renewables)	**41**	**64**	**1**

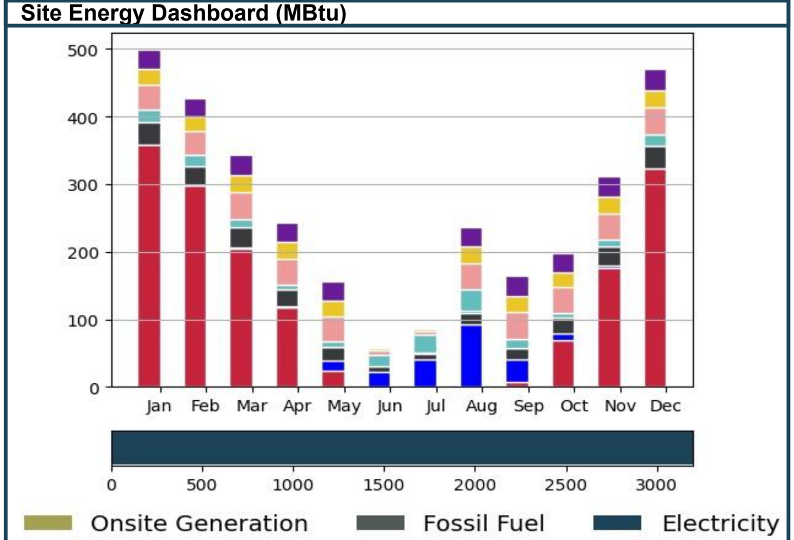
Project Viewer - 3D Model



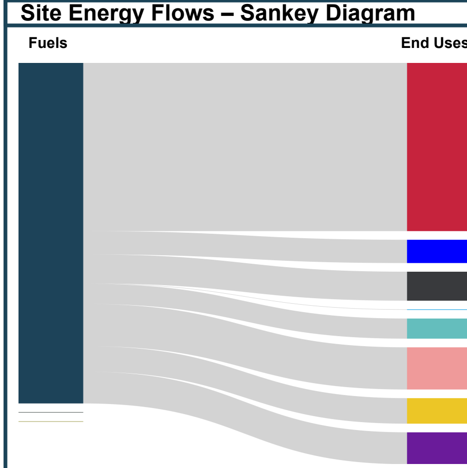
Site Energy Use Intensity



Site Energy Dashboard (MBtu)



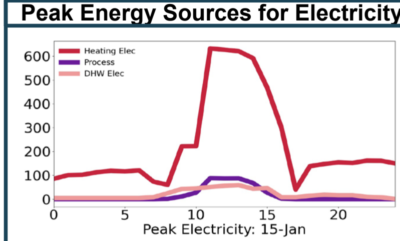
Site Energy Flows – Sankey Diagram

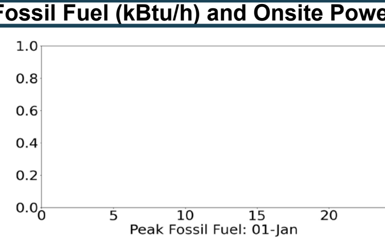


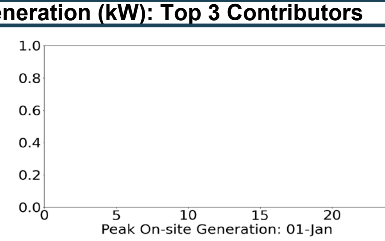
Annual Fuel Costs and Peak Demands

Fuels	Cost ($)	Peak Day	Peak Time	Peak Demand
Electricity	149,897.00	15-Jan	11:00	847.0 kW
Fossil Fuel	0.00	01-Jan	0:00	0.0 kBtu/h
Total	149,897.00	01-Jan	0:00	

Peak Energy Sources for Electricity (kW), Fossil Fuel (kBtu/h) and Onsite Power Generation (kW): Top 3 Contributors







MAINTENANCE AND OPERATION COST ESTIMATE OPTION 4A

A. OPERATION

	Systems	Quantity	Units	Total Cost
1	Two-pipe Chilled/Heating Water System	0	SQUARE FOOT	$0
2	Four-pipe Chilled Water and Heating Water System	0	SQUARE FOOT	$0
3	Heat Pump System	77007	SQUARE FOOT	$2,310
4	Condenser Water System	0	TON	$0

Total Service Cost	$2,310

B. MAINTENANCE - REPAIR

	Equipment	Quantity	Total Cost
1	Chiller, Air Cooled, Reciprocating; Repair air cooled chiller, 100 ton	2	$15,295
2	Water Cooled Condenser; Repair condenser, water cooled, 15 ton	8	$3,299
3	Fan Coil, DX Air Conditioner, Cooling Only; Repair fan coil, DX 3 ton	77	$12,999
4	Multi-Zone Air Conditioner; Repair multi-zone rooftop unit, 40 ton	4	$18,591
5	Single Zone Variable Volume; Repair single zone variable volume, 20 ton	4	$12,223
6			
7			
8			
9			
10			

Subtotal	$62,408

C. MAINTENANCE - FILTERS

	Equipment	Quantity	Total Cost
1	Particulate Air Filtration, Supported Type, 1"	77	$13,972
2	Particulate Air Filtration, Supported Type, 2"	16	$5,806
3	Particulate Air Filtration, Supported Type, 4"	8	$5,806
4	Particulate Air Filtration, Supported Type, 12"	0	$0

Subtotal	$25,584

D. MAINTENANCE - PREVENTATIVE MAINTENANCE

	Equipment	Quantity	Total Cost
1	Chiller, Recip., Air Cooled	2	$1,699
2	Condensing Unit, Water Cooled	4	$482
3	Condensing Unit, Water Cooled	4	$1,154
4	Air Handling Unit	4	$1,013
5	Air Handling Unit	4	$1,311
6	Fan Coil Unit	77	$18,774
7	Pump, Centifugal	6	$405
8	Controls	1	$272
9			
10			

Subtotal	$25,109
Total Maintenance Cost	$113,102

ONE TIME OPERATIONS COSTS ESTIMATE **OPTION 4A**

A. EXISTING[1]

Estimated Remaining Equipment Life	0 Yrs
Below the Line Costs Multiplier[2,3]	0.00
Subtotal HVAC Equipment Cost	$0.00
Total HVAC Equipment Cost	$0.00
Single Payment (P/F) Present Worth	**$0.00**

B. RENOVATION

Estimated Equipment Life	16 Yrs
Below the Line Costs Multiplier[2,3]	0.00
Subtotal HVAC Cost[2]	$0.00
Total HVAC Cost	$0.00
Subtotal HVAC Equipment Cost[2]	$0.00
Total HVAC Equipment Cost	$0.00
Single Payment (P/F) Present Worth	**$0.00**

C. ADDITION

Estimated Equipment Life	16 Yrs
Below the Line Costs Multiplier[2,3]	0.00
Subtotal HVAC Cost[2]	$0.00
Total HVAC Cost	$0.00
Subtotal HVAC Equipment Cost[2]	$0.00
Total HVAC Equipment Cost	$0.00
Single Payment (P/F) Present Worth	**$0.00**

D. NEW CONSTRUCTION

Estimated Equipment Life	16 Yrs
Below the Line Costs Multiplier[2,3]	1.67
Subtotal HVAC Cost[2]	$6,487,334.75
Total HVAC Cost	$10,811,058.00
Subtotal HVAC Equipment Cost[2]	$2,359,505.57
Total HVAC Equipment Cost	$3,932,084.99
Single Payment (P/F) Present Worth	**$5,466,048.46**

Total Cost **$5,466,048**

Notes:
1. HVAC equipment not replaced as part of scope of work
2. Values from or calculated based on cost estimate
3. Below the Line Costs include general conditions, overhead & profit, bonds & insurance, prevailing wage requirement, design contingency, and esclation

Energy Model Output Report

INTEGRATED ENVIRONMENTAL SOLUTIONS

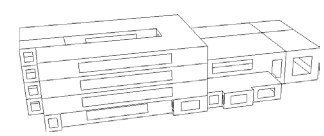
Project:	Piney Branch ES - Option 4B
Address:	7510 Maple Ave, Takoma Park, MD 20912
Climate File:	Baltimore_TMY2.fwt
Simulation:	Piney Branch ES - Option 4B.aps

Design Team:	JPA
Energy Analyst:	JPA
Owner:	MCPS
Conditioned Area (ft²):	68704.5000

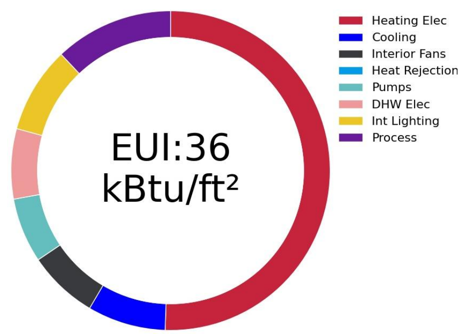
Annual Energy Consumption (kBtu/ft²/year) & CO2 KgCO2/ft²/yr

Energy End Use	Site Energy	Source Energy	CO2 Emissions
Heating Fossil Fuel	0.0	0.0	0.0
Heating Electricity	18.5	29.2	0.8
Space Cooling	2.9	4.2	0.1
Fans Interior	2.6	4.0	0.1
Heat Rejection	0.0	0.1	0.0
Pumps	2.4	3.6	0.1
DHW Fossil Fuel	0.0	0.0	0.0
DHW Electricity	2.6	4.0	0.1
Interior Lighting	3.2	4.9	0.1
Exterior Lighting	0.0	0.0	0.0
Receptacle	0.0	0.0	0.0
Data Center	0.0	0.0	0.0
Cooking Fossil Fuel	0.0	0.0	0.0
Cooking Electricity	0.0	0.0	0.0
Elevators & Escalators	0.0	0.0	0.0
Refrigeration	0.0	0.0	0.0
Process	4.4	6.7	0.2
TOTAL (ex renewables)	**36**	**56**	**1**

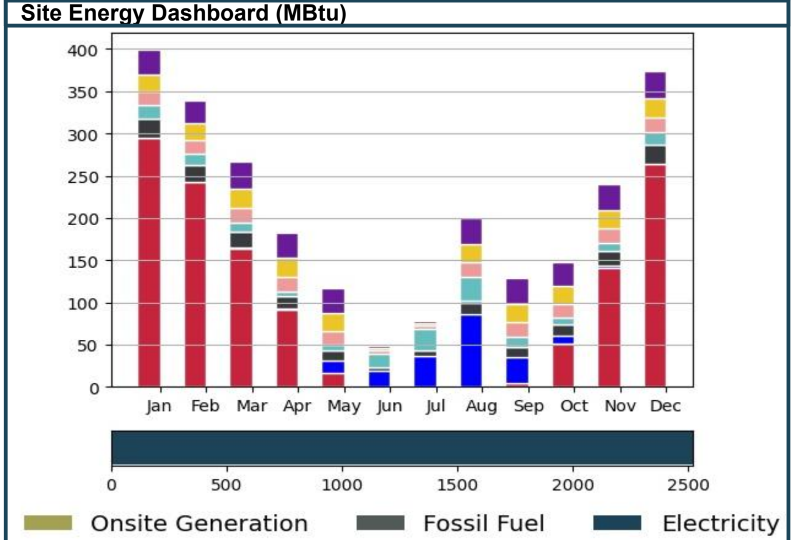
Project Viewer - 3D Model



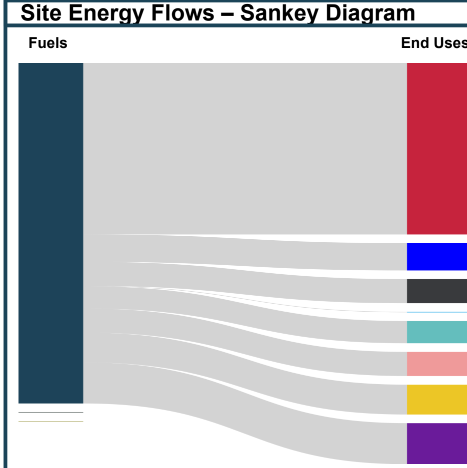
Site Energy Use Intensity



Site Energy Dashboard (MBtu)



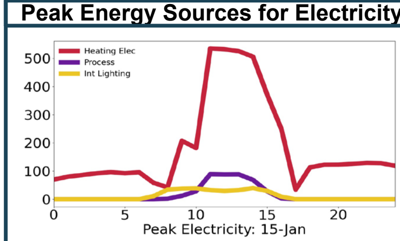
Site Energy Flows – Sankey Diagram

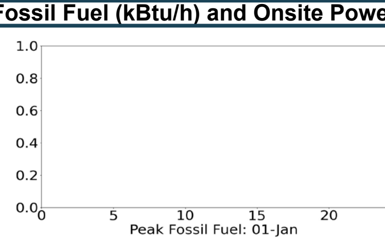


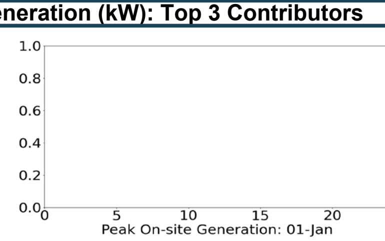
Annual Fuel Costs and Peak Demands

Fuels	Cost ($)	Peak Day	Peak Time	Peak Demand
Electricity	118,148.00	15-Jan	11:00	709.4 kW
Fossil Fuel	0.00	01-Jan	0:00	0.0 kBtu/h
Total	118,148.00	01-Jan	0:00	

Peak Energy Sources for Electricity (kW), Fossil Fuel (kBtu/h) and Onsite Power Generation (kW): Top 3 Contributors







MAINTENANCE AND OPERATION COST ESTIMATE — OPTION 4B

A. OPERATION

	Systems	Quantity	Units	Total Cost
1	Two-pipe Chilled/Heating Water System	0	SQUARE FOOT	$0
2	Four-pipe Chilled Water and Heating Water System	0	SQUARE FOOT	$0
3	Heat Pump System	68705	SQUARE FOOT	$2,061
4	Condenser Water System	0	TON	$0

Total Service Cost	$2,061

B. MAINTENANCE - REPAIR

	Equipment	Quantity	Total Cost
1	Chiller, Water Cooled, Reciprocating; Repair water cooled chiller, 200 ton	2	$21,229
2	Water Cooled Condenser; Repair condenser, water cooled, 15 ton	7	$2,887
3	Fan Coil, DX Air Conditioner, Cooling Only; Repair fan coil, DX 3 ton	69	$11,649
4	Multi-Zone Air Conditioner; Repair multi-zone rooftop unit, 40 ton	4	$18,591
5	Single Zone Variable Volume; Repair single zone variable volume, 20 ton	3	$9,167
6			
7			
8			
9			
10			

Subtotal	$63,523

C. MAINTENANCE - FILTERS

	Equipment	Quantity	Total Cost
1	Particulate Air Filtration, Supported Type, 1"	69	$12,520
2	Particulate Air Filtration, Supported Type, 2"	14	$5,081
3	Particulate Air Filtration, Supported Type, 4"	7	$5,081
4	Particulate Air Filtration, Supported Type, 12"	0	$0

Subtotal	$22,681

D. MAINTENANCE - PREVENTATIVE MAINTENANCE

	Equipment	Quantity	Total Cost
1	Chiller, Recip., Air Cooled	2	$1,699
2	Condensing Unit, Water Cooled	3	$361
3	Condensing Unit, Water Cooled	4	$1,154
4	Air Handling Unit	3	$760
5	Air Handling Unit	4	$1,311
6	Fan Coil Unit	69	$16,823
7	Pump, Centifugal	6	$405
8	Controls	1	$272
9			
10			

Subtotal	$22,785
Total Maintenance Cost	$108,989

ONE TIME OPERATIONS COSTS ESTIMATE **OPTION 4B**

A. EXISTING[1]

Estimated Remaining Equipment Life	0 Yrs
Below the Line Costs Multiplier[2,3]	0.00
Subtotal HVAC Equipment Cost	$0.00
Total HVAC Equipment Cost	$0.00
Single Payment (P/F) Present Worth	**$0.00**

B. RENOVATION

Estimated Equipment Life	16 Yrs
Below the Line Costs Multiplier[2,3]	0.00
Subtotal HVAC Cost[2]	$0.00
Total HVAC Cost	$0.00
Subtotal HVAC Equipment Cost[2]	$0.00
Total HVAC Equipment Cost	$0.00
Single Payment (P/F) Present Worth	**$0.00**

C. ADDITION

Estimated Equipment Life	16 Yrs
Below the Line Costs Multiplier[2,3]	0.00
Subtotal HVAC Cost[2]	$0.00
Total HVAC Cost	$0.00
Subtotal HVAC Equipment Cost[2]	$0.00
Total HVAC Equipment Cost	$0.00
Single Payment (P/F) Present Worth	**$0.00**

D. NEW CONSTRUCTION

Estimated Equipment Life	16 Yrs
Below the Line Costs Multiplier[2,3]	1.71
Subtotal HVAC Cost[2]	$5,643,021.46
Total HVAC Cost	$9,647,924.97
Subtotal HVAC Equipment Cost[2]	$2,041,531.17
Total HVAC Equipment Cost	$3,490,424.36
Single Payment (P/F) Present Worth	**$4,852,089.60**
Total Cost	**$4,852,090**

Notes:
1. HVAC equipment not replaced as part of scope of work
2. Values from or calculated based on cost estimate
3. Below the Line Costs include general conditions, overhead & profit, bonds & insurance, prevailing wage requirement, design contingency, and esclation

Appendix E

IAC Feasibility Study Cost Estimate

Appendix F

Community Engagement Survey Results

Piney Branch Elementary School
Feasibility STUDY
Survey Results

Stantec electronically distributed surveys regarding the existing and future state of Piney Branch Elementary School to the local community over the course of five community meetings. Surveys were broken up and grouped into three categories to identify the respondent's affiliation with Piney Branch Elementary School. Those three categories were parents, neighbors, and staff. The results of the surveys are listed below.

Survey 1
What are your favorite things about the Piney Branch building/site?

Parents – 23 Responses

a. The pool
b. Location (my kids walk), pool, central library
c. Location to low income housing and recreation after care and teen activities. Kids can walk and not need parents to get to and from.
d. The pool
e. Larger than normal core spaces - gym, cafeteria, Main office
f. Location. Next to playground where after care activities and sports are held and new library! Close to home. Children can be independent and walk and come back on their own. I don't know the building inside so I can't tell what I like the most of the interiors.
g. The pool
h. Location and community
i. The pool, proximity in neighborhood, the pool
j. Pool!
k. That it is walkable from my home and not a long bus ride for any student. Don't close it for any period of time!!
l. Pool. Please keep it!
m. Pool. The location.
n. Love the proximity to TPES, the police dept, and the library. Walking distance to/from 'Main street'/downtown Takoma Park.
o. Central location in TKPK. We cannot bus our very young children an hour each way for the duration of this project. You must find a way to keep them onsite or very close by. Figure out a way to make it work with Parks and Planning for a land swap with the park, or use the old hospital site. It is an unreasonable burden on families, many of whom in this area rely on public transportation and likely do not have flexible work schedules, to have their very young children an hour bus ride away for years. Unacceptable.
p. Close to TPES. Next to community center and library. Access to park. Nice gym and MP room. Fun fish tank.
q. The location by the park and near the other schools is amazing for parents with kids in both piney branch and tpes.
r. Location

s. Really appreciate its location in central Takoma park. I only have one kid but I know that many people with multiple kids appreciate that it's nearby Takoma Park elementary school. I also use the pool about 10x a month and my kid does stroke school during the school year - so view the pool as a great amenity that I hope can be retained in the final design
t. It's central location, proximity to the park & library.
u. Pool, large field, playground, location of the school.
v. Proximity to town and residences.

Neighbors – 17 Responses

a. Pool
b. Pool and gym
c. The pool. Specifically. Small. Quiet. Walkable. Not a big glitzy operation. Kids learning to swim Adults doing laps. The locker room is fine. The pool is fine. Want the pool to stay. Don't want to be funneled / forced to the SS aquatic center. That is a pain to get to. SS does not have the neighborhood feel this local community pool does
d. Proximity to many children and the pool!
e. The pool
f. Definitely the swimming pool, both for students and for the community.
g. Access to adjacent parklands, adjacency to the Takoma Park library, easy access for many lower income families, local pool.
h. Pool, proximity to library
i. The pool! Walkable
j. The teachers, the pool and the fact that our kids learned to swim in school, the library and that the kids can go to aftercare at the community center right across the street
k. That it is a neighborhood school. It is really important in this down county neighborhood to have a neighborhood school.
l. Nothing . It's a cumbersome design. the traffic flow is confusing. Its cramped. It's next to the drop off point for persons the TPPD arrests
m. The pool! We need to keep the pool and keep kids at the school building (no busing far away) throughout this rebuild.
n. Swimming pool
o. The pool! Keep it it's a wonderful community resource!
p. It is walkable for many students. Good to share outside space with a county park.
q. Location convenient to students and parents
Close to city library and apartments and other schools
The pool! Abuts a large park

Staff – 0 Responses

Survey 2

What opportunities for improvement to the building/site excite you the most?

Parents-15 Responses

a. Better interface with adjacent streets, playgrounds
b. Keeping the pool, maybe giving it some upgrades!
c. Creation of a plaza. Ability to separate cars and busses and add parking. Going Green.

d. I'd really love to see better integration between TPES and PBES in terms of accessibility. Most families will simultaneously have children in both schools at some point, and right now kids walk through this weird cut-through to get from one to another. I'd love to see a more thoughtful, beautiful path between the two schools.
   I am hopeful that the new building and construction process itself will be as green as possible, and will take Takoma Park's climate-friendly ethos into account. Maybe this means a living roof or solar panels. I'd be excited to see innovative measures on this front.
   We talked a lot at the meeting about possibly siting the new school at the Piney Branch Park. This honestly seems ideal in so many ways. Aside from the busing issue, it would give our kids access to a beautiful green space right outside their door.
e. I don't know the building inside. Only the pool space which is very old. I don't think it needs to be turned down though. Should be remodeled during summer and keep the students on site. Phased and smaller remodeling instead of demolition would also help the environment. For overcrowded reasons, another school should be build.
f. There is an opportunity to build the school on the Montgomery Parks land behind the school, and turn the current school site into park land. This would allow children to stay in the current school during construction, and would put the school outside of a known floodplain. It would also likely be much more controllable in terms of costs because the current PBES site sits on Brashaer's Creek, which has already extended building timelines for the Takoma Park Community Center and the Library.
g. The opportunity to make all the bathrooms single stall and gender inclusive. There is no need to have gendered bathrooms in a new build.
h. I'm excited by the land-swap prospect. This would out PBES in closer proximity to both TPES and TPMS creating a large potentially shared campus. I look forward to an urban style school (3-4 stories) with a small footprint / rethinking how land can be used to support a school. I look forward to restoration of grass and field and a stream along Maple Ave giving the hyper local community a more accessible park.
i. None of them. Keeping the site continually open and operating matters way more to me than any of the potential improvements.
j. I hope we have a modern, bright and airy school for the children. More daylight, better lighting, and great air quality. I would love if this project had a sustainability focus. Fully electrified and net zero energy. Similar to Discovery school in Arlington or John Lewis school in DC.
k. Having a more modern school with modern HVAC and floor plan.
l. Our kids and the teachers deserve a modern facility that have top amenities and room to grow. I'm excited to see that implemented but MCPS needs to solve the logistics of student displacement prior to moving ahead with spending more money.
m. I'm excited to have the building demolished and replaced with better traffic management, more natural light, and architecture that looks less like a prison. I'm also excited about the prospect of a new pool.
n. The school is in poor shape. I really hope that the design that is selected can create natural light, better ventilation and overall better academic experience for students and teachers.
o. A total rebuild to fully address all the needs and set our community's children up for success for decades to come.
   Increasing pedestrian and bike safety & infrastructure to protect students from cars.

Neighbors – 10 Responses

a. Better facilities for the community
b. Better signage and programming for the pool.

c. Build up and back to be able to be taller with a fire-safe entry and exit on the MNCPPC park land
d. Keeping the pool with its current footprint and facilities. Rather than filling it in. Or making keeping it crazy expensive by proposing a pool facility that is fancier than what's needed for a local community pool
e. Possibility of going up one story by creating direct egress/ingress from school to level of playground and playing field.
f. Build on the park so the school can stay open and the new construction can be out of the floodplain.
g. An expanded pool.
h. Modern updates
i. This building needs to be demolished and start over. Renovation has been tried and it is still a horrible layout (I worked in the building in early 2000s and it was awful layout) The building was built as open concept Jr High and the attempt to make it a functioning elementary are poor at best.
j. Update the classrooms, add some classrooms, keep pool

Staff – 0 Responses

Survey 3

What are the biggest limiting factors of the Piney Branch building/site?

Parents-21 Responses

a. Accessibility, lack of windows, poor interface with Grant Ave, terrible access to playground, poor HVAC
b. I cannot think of any
c. Minor annoyances only - closing for any period of time would be way worse than just continuing upkeep.
d. What will happen to the children at pbes? This will have a major impact on our children who will have to travel 45 minutes. Why can't you just build behind the building and then tear it down?
e. Site size
f. I think that a holding school would have staff turnover, impact aftercare, and longer bus rides might impact student achievement and parental engagement. If it is possible to use the park, that would alleviate concerns.
g. No windows in the classrooms
h. The current site is in a flood plain. I think that having it build up higher on the current playground would be a better option.
i. Busing kids out of this area is not practical. Keep the site while you do construction
j. Too many stairwells. These take up a lot of space and make the flow disruptive. It is not universally handicap accessible. The cafeteria is too small - only 1/2 of each class can eat at a time forcing some kids to eat very early or very late. This also splits the classes into pods which limits interactions with other friends.
k. The lack of a dedicated school playground/field. Using the adjacent park is alright but there are often maintenance and cleanliness issues that the school can't address because it isn't theirs.
l. Please keep the pool.
m. The quirky multi level nature of the building. It seems like there's lots of wasted space. There are also a lot of children.
n. Limited footprint

o. Confusing layout, outdated HVAC system, unwelcoming design, dated interior.
p. Need to ensure that during the transition period, students and families are well supported by a local holding school
q. The size makes operations hard for the school. Otherwise it is a great site at the heart of the community.
r. Scary drop off/pickup that creates a huge traffic bottleneck every day on maple ave. No natural light in many of the classrooms. Deteriorating heating and cooling systems. A pool that needs to be renovated.
s. Old structure
t. Small site, old building in need of repairs
u. Appears to be site size and underground management of storm water.

Neighbors – 17 Responses

a. City disruption
b. Small size, lack of windows in classrooms, bad ventilation, HVAC doesn't work well, lack of parking
c. Parking
d. Size of current lot--BUT expansion onto MNCPPC land is an option according to the 1969 MOU that formed basis for original school site acquisition
e. Safety and congestion at drop off and pick up, outdated re: accessibility
f. Natural light for students
g. Not enough advertising for the pool.
h. Small footprint plus floodplain
i. Lack of windows, ugly,
j. It's a weird and confusing design. The kids learn to navigate. Not accessible. Poor traffic flow
k. We need to work with MNCPPC to get use of the adjacent park and keep the school building open during construction.
l. Limited swimming pool hours
m. No opinion
n. The school has very odd layout. Facilities are old and out of date. Footprint is small so needs to be built up and still have full accessibility.
o. Small site and no flexibility from county to creatively utilize it
p. The entire building is poorly designed. The classrooms do not fell inviting.
q. Maintaining access to community resources is critical, including the pool and large gymnasium

Staff – 2 Responses

a. Students in wheelchairs or on crutches must walk through other classrooms to get to their classroom.
   HVAC systems do not adequately heat and cool the building resulting in challenges for student learning.
   Children can access the roof from carious locations.
   Unsafe arrival and dismissal due to the lay out of the bus.
b. The layout of the building and its age

Survey 4

Pool Survey – 98 Responses

1. How often do you or your family use the Piney Branch Public Pool?
   a.

Daily	5%

   b.

Weekly	40%

   c.

Monthly	18%

   d.

Yearly	13%

   e.

Never	24%

2. What activities do you primarily use the pool for?
   a.

Swimming Lessons	17%

   b.

Recreational Swimming	25%

   c.

Exercise / Fitness	46%

   d.

School Events	7%

   e.

Other	5%

3. How important is the availability of the pool to you and your family?
   a.

Very Important	58%

   b.

Important	13%

   c.

Neutral	7%

   d.

Not Very Important	4%

   e.

Not Important at all	18%

4. What improvements or changes would you like to see at the pool?
    a.

Better maintenance/cleanliness	30%

    b.

Extended hours of operation	28%

    c.

Upgraded facilities	18%

    d.

Additional programs/classes	11%

    e.

Other	13%

5. Is the pool at the Silver Spring Recreation and Aquatic center accessible to you and your family?
    a.

Very Accessible	21%

    b.

Accessible	18%

    c.

Somewhat Accessible	31%

    d.

Not Very Accessible	22%

    e.

Not Accessible	7%

6. Is pool at the Silver Spring Recreation and Aquatic center a good alternative pool for you and your family to use in lieu of a pool at Piney Branch Elementary School?
    a.

Yes	32%

    b.

No	68%

7. If you answered no, please describe the reason or any challenges that you and your family have with using the Silver Spring Recreation and Aquatic center vs a pool at Piney Branch.

    a. Not accessible for low income people without cars. More expensive. Not available to PBES students in school. Requires two block walk from paid parking.
    b. Too crowded, hard to park.
    c. There is no parking and it’s not convenient
    d. We walk to PBES
    e. I can walk to the PBES pool and am now getting ready to walk there with my grandson

f. It's not in walking distance, longer travel time, need a car or to take Metro, have to pay for parking, etc.
g. Difficult to get to SS. Adds an hour to my swim time. Big. Noisy. No lap lanes in late afternoon / early evening.
h. No parking closer than 3 blocks away, including no handicapped parking. I have a handicap placard and use a mobility device and there is nowhere to park even with my placard.
i. Transportation
j. I walk to the pool at PBES. I would have to take a bus to SS and it would take much longer to get there.
k. Piney Branch much more convenient
l. Location. Kids can get independently to the PB location. Parking at the SS pool might be hard. PB is next to the schools and kids can access it easily.
m. Farther away and more crowded
n. Piney Branch is closer
o. We bike or walk often, and would not be able to do that. The SS Aquatic Center doesn't have evening swim lessons that I know of, and even if it did the quality of MoCo swim lessons is significantly lower than A1. And we wouldn't be able to make it all the way over there between when I get off of work and when we need to get the kids in bed anyway. Recreational swim for kids is barely open and is insanely crowded when it is. It gets so loud that I'm worried for my kid's hearing and some of our friends' kids aren't able to handle it from a sensory standpoint.
p. The proximity of the Piney Branch Pool is better.
q. Further away, more costly, very limited hours of free swimming
r. We need a pool that is within walking distance.
s. The SSRAC tends to be busy or full and does not provide some activities such as the kayak pool session.
t. I can get to the piney Branch pool easily without a car. I love having a pool in the community, rather than commuting to another city
u. It is not a good alternative because I need a car to get there
v. only pool easily accessible without car (we only have one that is gone during the week)
w. Transportation time and cost
x. Piney Branch is very easy and quick to get to and parking is easy on the weekend. My son loves taking swim lessons there, and it's great having it so close to home.
y. Cost and convenience are critical factors for my family.
z. Distance/travel time
aa. The Silver Spring pool is several miles away.
bb. PB is walking distance. SS parking and construction is a mess.
cc. Farther away. And harder to get to without a car.
dd. Harder to get to and parking
ee. The Piney Branch pool is at a walkable distance for my family, while the SS rec pool is not, so is more restrictive by needing transport and parking. The PB pool is also accessible to my children during and after school, including walking from TPMS.
ff. Limited driving options / much greater commute time and difficulty
gg. Piney branch is right here and we use it all the time. Time and end and transportation and cost are all challenges to the silver spring pool.
hh. We have no car and the PB pool is a ten minute walk while the SS pool is about 2 1/2 miles away.

ii. it is much further from home and requires 2 buses or a long walk to the Takoma Metro station or driving and then paying to park in a public garage.
jj. Can walk to piney Branch. Important for kids to have swim unit
kk. Too far.
ll. #1. Much closer. #2. Won't be used for school PE lessons. #3. Much smaller and less competition for use.
mm. Traffic getting there is terrible on weekdays
nn. We live in DC and would use the DC pools instead. But Piney Branch offers a fantastic, more local pool for Daleview stroke and turn and adult masters swim - three members of our family use it weekly throughout the fall-winter-spring.
oo. Much longer commuting time to get to the silver spring pool is a barrier to use.
pp. I love the new SS facility. However, the distance presents friction. We only have one car, so arrangements have to be made to get there. The proximity to our own community pool makes this accessible and easy to use.
qq. I am concerned about plans being made for the MCPS PBES renovation and whether to keep the pool. The PBES pool is very important to me. I am an older and disabled adult who is unable to drive, but the proximity of this pool allows me to walk to it to swim laps, which is necessary for my health. The pool is also an important resource to Piney Branch Elementary School children. It allows them to be taught and to learn the vital skill of swimming. I know that many other people in my neighborhood use this pool on a regular basis. The pool has had a recent upgrade, so it would be a total waste of taxpayer dollars to tear it out. This pool is important to keep for recreational and for exercise/ lap swimming. Thank you for listening to and addressing my concerns.
rr. I live closer to PBES.
Parking and traffic to get to downtown SP is a deterrent for me to use the SSRA.
Neighborhood feeling in PB is much better than SSRA.
ss. The pool is a mile from my house and we can bike there. Our lives are busy, and having a pool close by makes it more likely that we will use the pool.
tt. The pool at PBES is walkable to our community but much more importantly it is used by school children all year long to learn swim skills as a normal part of the PE curriculum. This is a unique feature of PBES and should not be eliminated. Ssrac is not a great equivalent, it's a half hour bus ride, lap swimming hours are limited, and you're obviously not sending school kids there for PE.
uu. We can walk to Piney Branch which makes it way more accessible and likely for us to use it. Not only do you have to drive to Silver Spring, there isn't very convenient parking for the Aquatic Center.
vv. The hours for the kids area at Silver Spring Recreation and Aquatic Center are very limited during the week and as far as I know, they don't offer swimming lessons. So most of the reason we use piney branch pool is not available at SS. It's also a lot further and there's no parking for that pool except in a public garage down the street.
ww. A local pool would provide a place for people of all ages without the need for transportation to Silver Spring...
xx. Hard to get to
yy. Altho we access the SS rec center we would prefer to keep the piney branch pool open for all. I love that my children can take lessons during PE at the school. If I knew the piney branch operating hours I would likely use it more often
zz. we can walk to PBES and not to SS, where we have to pay for parking
aaa. SS is much more inconvenient to get to and park at and is already crowded.

bbb. Much further away for my family

ccc. PBES is both walkable and AVAILABLE to community.

ddd. Too far, limited parking

eee. It's a gorgeous pool, but it's too far away. I love visiting it occasionally but I can't get there during the week. I would lose my ability to swim several times a week if the piney branch pool closed.

fff. A local pool is easier and quicker to get to and usr

ggg. Parking is difficult. It requires driving, often with bad traffic in downtown Silver Spring.

hhh. We moved to our home in part because of its proximity to the pool. Swimming and access to a pool are extremely important to us, and we consider the Piney Branch pool one of the town's most important assets.

iii. The public transportation the that pool is both very time consuming and unreliable.

jjj. It's not easy or convenient to get to the center. Parking is a problem.

kkk. This survey is TERRIBLE. You can not select more than one option and you can not explain what you mean by "other". The improvements that I would like and that are essential if the pool is kept are 1) an operator that is competent and does not send young people away because they don't know their own rules and can not comprehend that teens can swim, and that permits the staff present to talk to parents and does not sent male janitorial staff into the changing rooms while young girls are in there changing and 2) that the children at PBES receive swimming instruction during the school day -- this does not happen at present and the pool is in no way a benefit to any students at PBES. Given that there is ZERO chance of the latter happening, then there is no reason to keep a pool at the school, where it will take funds and space away from the students and teachers.

Additionally, whose smart idea was it to list survey links as QR codes only on your website? If you open the PDF on a computer there is no way to open QR codes which I had to scan on my phone and then email myself to use on the computer. PLEASE please do the simple thing and share actual clickable links on any online documents. QR codes are only useful if the document is printed and being used by people with cell phones. This kind of thing (together with the useless questions) reduces my confidence that there is any kind of competent process to gather feedback in place.

lll. I understand that it is costly per visit.

mmm. Piney Branch is within walking distance of my house; SSRAC is not. Requiring me to walk, take the subway, or a bus to the SSRAC would add an hour or more to each exercise session (twice a week). Also, there are very limited lap lanes available at SSRAC in late afternoon, which is my preferred time to go.

8. Do you have any additional comments or suggestions?
   a. Leave the damn pool alone.
   b. Save the pool.
   c. I do hope the pool stays because it's so important that our kids receive swimming lessons during school
   d. The pool needs to be more accessible, visible, convenient to the entire community
   e. My car-less neighbors and the kids who go to PBES really need this local resource more than I do
   f. Honor the MOU and keep the pool. Increase programming
   g. Don't try to reproduce SS pool. Plan for affordable swim lessons

h. The pool is heavily used by seniors, children, and people of color. Please don’t take away the pool!
i. We heard a lot at the meeting why it’s so important to keep the pool. I am overall mostly neutral about this, but I want to point out that everyone who spoke up about this was of an older generation, or who used the pool as children. If we keep the pool, I really want to make sure that CURRENT STUDENTS are using it, aside from the paltry six weeks of gym units. It is designed as a lap pool and is not particularly child-friendly (no real shallow end, no play features) and I don’t know any young families who use it regularly. If the decision is made to keep it, I would want to see a commitment from MCPS and pool management that it really is going to try to serve everyone. Meaning affordable swim lessons, group classes for children, maybe a low-key swim team. Right now swim lessons are $93 for 30 minutes, despite being located in the midst of the city’s lower-income housing. If those commitments can’t be kept, then nix the pool and use it to better serve our students in whatever way they need. This is a school first and foremost, and our kids should come first full stop.
j. Please renovate the building and keep the pool! The locker room needs to be cleaned regularly
k. This survey doesn't allow me to select multiple options, so I had to pick one. My family has used the pool weekly for 2+ years. I swim laps while my kids take swim lessons and this is the only place I've found that allows for that. I can do this on weekdays because it's walking distance to my house. We meet my kid's friends there on weekends for a quick swim and don't have to work around the crazy hours of the SS Aquatic Center. The pool has been extremely beneficial in our lives, for our health, and as a gathering place for the community. Please contact me if you want to follow up on anything at all - Isabelle Hasty, Takoma Park Ward 1, isabelle.hasty@gmail.com
l. In the new pool having gender inclusive bathrooms and changing spaces is best practice.
m. Please don’t close the pool it is a huge resource for swimming. Both lessons, stroke and turn and master swim.
n. Please work with MNCPPC to build on the adjacent park land and keep the school building open during renovation/construction.
o. Keep the pool! it is a community resource. Don't make us drive out to the other ones please
p. No
q. please keep the pool!
r. Getting rid of the pool to prevent closing the school for years is a fine trade.
s. In addition to the silver spring pool there is also the Takoma DC pool and the YMCA which are all within 2 miles of Piney Branch. This site should be prioritized for school programming or daycare services.
t. I support expansion and renovation of piney branch ES, but think this can be done while keeping the pool.
u. we would hate to have to drive to Silver Spring to access the nearest pool given taxpayer dollars already went into renovating this very accessible nearby pool.
v. PLEASE keep Piney Branch pool open and maintained for me, my family, and our large community that uses and LOVES the pool!
w. I use the pool, but at the same time I would completely understand if MCPS makes plans to remove it. The reality is it is often empty. I have been there on rainy weekend days, when it would be a great active option for Takoma Park residents - and sometimes the kids I bring and I are the only ones there. Don't get me wrong, I love having something

like this in walking distance. But if difficult decisions need to be made, I personally understand. If the pool were that important for the community, more people would be using it. The current management keeps a log of sign-ins and they should be able to provide that data. Regarding question #4 regarding improvements: the lifeguards typically just look at their phones and don't watch the swimmers.

x. Keep the PBES pool!
y. The pool at piney branch is the best option for low income families who live near it. It is a very important asset to the community
z. The pool is a valuable resource, and the availability to school children, including swim lessons is not only critical, it is a matter of racial justice.
aa. Please Provide notice and comment opportunities on the site - why aren't larger nearby sites being considered to rebuild?
bb. While it's not as important for me to use. I very much value the accessibility of the pool to local residents (adults and kids) who don't know how to swim or don't have access to swimming resources.
cc. The PB pool is an invaluable resource for us and our community and has been for our family for adult exercise, swimming lessons, school gym and swim practice over the years.
dd. KEEP Piney Branch pool!!!
ee. Better management of the PB pool would attract more patrons. It is a gem of a facility that needs to be kept cleaner.
ff. Save the Piney Branch Pool!!!!
gg. Build a new school with a new pool
hh. the PBES pool is very important to the community! please keep it! it serves a population that doesn't often have access to a pool. silver spring is not a good alternative
ii. I would love to see upgrades to the facility (eg. windows and ventilation). But mostly, I'd love to have additional programs, like swim lessons for my kids and AquaAerobics, water running, and other water fitness classes.
jj. The current steps leading into the Piney Branch Pool need to be upgraded. They currently do not meet the required step height for accessibility into a pool. The pool is also very poorly maintained and the shower areas need more regular cleaning and maintenance.
kk. We would vastly prefer the school be renovated in a way that is best for the children and ensures enough space. Would be more than happy if that meant the pool had to go. There are plenty of other available options.
ll. There comes a time when we need to consider putting the needs and health of 700+ elementary school students who spend hundreds of hours a year in classrooms with no windows, leaking cielings, chronic HVAC issues, and lead in the drinking water before the convenience of a few dozen adult swimmers with ample pool options nearby.
mm. PBES clearly has the potential to cater to a different community than SSRA if PB were to be upgraded. Upgraded PB would be very busy with swim clubs and elderly activities given the the very high demand of these activities everywhere in down county.
nn. Question 4 should allow multiple responses. The pool is old and it needs upgraded equipment as it seems broken a lot. But a pool of approximately the same size and features would be great.
oo. This school has a very limited footprint. All available space should be used exclusively for school use. The SS Aquatic center is far superior to tiny pool at PB.

pp. This pool is small but mighty and is really a special gem we have in TKPK. It would really be a shame to destroy it when there are alternatives that keep it functioning.
qq. It's invaluable to have a pool right in Takoma Park. And the pool seems to get heavy use, from lap swimmers, to swim lessons, to kids playing in the pool after school, to swim meets. It's a public space that is used and busy and that alone is reason to keep it, but it also plays a central role in our community and in the PBES learning experience.
rr. no
ss. Please do not close this pool!
tt. keep the pool
uu. While maintaining the pool is nice, the real priority should be placed on finding a suitable plan for an upgraded piney branch elementary school that will improve learning conditions for Takoma Park's elementary school aged children. If the pool is not able to stay in the end, as long as there is a school that is large enough and improved, that is the priority.
vv. Consider using the pool area as a daycare or special needs classroom space - something that is related to the school
ww. The current pool is almost hidden away. It's been hard to get information on swim lessons and public access. I hope a renovated pool will be more welcoming to the community.
xx. Save the Piney Branch pool! It is a wonderful community asset.
yy. Renovate or replace the pool when you renovate or replace the school.
zz. More pool use for students!Knowing pool is there is vital to seniors who need it most when they are least able to make a longer less convenient trip to SS bnb
aaa. There was not an option to mention this, but we use the pool multiple times per week. We highly value the pool and hope we can keep it at Piney Branch.
bbb. I do not believe we should continue to have a pool at piney branch—there is actually very little exposure of the kids in the school to actual skills during their school unit and I think focusing on expanding the school is much more important than maintaining a pool as part of the project.
ccc. We moved to Takoma Park because we can do most things by foot, including going to the pool. More importantly, I see many neighbors' kids learn how to swim in Piney Branch Pool. If you take our pool away, Takoma Park will be a "dry" town again :-).
ddd. MCPS should eliminate the pool so limited resources can be used for student learning.
eee. I think the pool is a beloved community resource & it would be a shame to lose it.
fff. The piney branch ES pool is a great amenity for both the kids and the community. What a great opportunity to make sure all kids learn about water safety.
ggg. This survey is TERRIBLE. You can not select more than one option and you can not explain what you mean by "other". The improvement that I would like and that are essential if the pool is kept are 1) an operator that is competent and does not send young people away because they don't know their own rules, that permits the staff present to talk to parents and does not sent male janitorial staff into the changing rooms while young girls are in there changing and 2) that the children at PBES receive swimming instruction during the school day -- this does not happen at present and the pool is in no way a benefit to any students at PBES. Given that there is ZERO chance of the latter happening, then there is no reason to keep a pool at the school, where it will take funds and space away from the students and teachers.

hhh. The pool should not come at the expense of being able to ensure safety and educational standards are met.

iii. I would prioritize ensuring there is sufficient classrooms, arts and community gathering spaces over the pool.

jjj. The pool is old and gross with disgusting locker rooms. The space should be used for the school reno.

kkk. I have used the Piney Branch pool for the last 20 years or more (at least during the years of that period when it has been open), twice a week regularly. Its easy accessibility is a large reason I exercise regularly.