



William Paca / Old Post Road Elementary School

## Scope Study

Submitted to:

### Harford County Public Schools

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Bel Air, Maryland 21014



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## Introduction

The William Paca/Old Post Road Elementary School located in Abingdon, Maryland, is a unique campus style school where the student population is divided into two separate buildings on the same site. The school complex consists of three, single-story buildings and four portable classrooms. The school's classrooms are split into primary classrooms (pre-kindergarten – second grade) in the Old Post Road building and the secondary classrooms (third – fifth) are located in the William Paca building. These buildings are separated by a staff parking lot, bus loop and a multipurpose field.

Built primarily in 1964, William Paca/Old Post Road Elementary School is an aging facility that is structurally sound and well-maintained. However, given the broad and accelerated change that continues to influence learning and instruction, the current William Paca/Old Post Road Elementary School cannot keep pace with the facility demands of today's educational imperatives. Its interiors are clean and mostly well lighted, yet they are drab and uninspiring.

The overall quality of the physical learning environment at William Paca/Old Post Road Elementary School suffers from insufficient space, outdated systems, the absence of natural light, visual monotony, inflexibility, and makeshift modifications to offset program and building deficiencies. Mechanical and electrical short comings include lack of air conditioning of 90% of the William Paca portion of the facility.

Further, the current site does not properly manage pedestrian and vehicular traffic patterns. In short, William Paca/Old Post Road Elementary School no longer reflects a standard for elementary school facilities that is consistent with the Board of Education's vision for Harford County.



## Purpose

The purpose of the scope study commissioned by Harford County Public Schools (HCPS), was to assess the physical condition of the existing buildings and site, offer recommendations for improvements or replacement of current facilities, and present three (3) options for consideration by the Board of Education (BoE).

The William Paca/Old Post Road Elementary School Educational Specification (Ed Spec), describes the optimum teaching and learning environment, consistent with fiscal constraints, for the education of the children of Harford County. The Ed Spec and each improvement option involving construction of additional space, addresses the educational facility requirements for an elementary school with three (3) State Rated Capacities, that of 926, 1,063 and 1,154 serving grades Pre-K through 5th. The current school has a State Rated Capacity of 940 students. The current enrollment is approximately 1,046 students in grades Pre-K through 5th.

The scope study team worked closely with the School Study Committee to determine the most reasonable approach for each option. Six (6) meetings with the School Study Committee were held between December 2008 and May 2009. The committee began by establishing a framework to guide its discussions and consideration of the various alternatives that would be developed throughout the study process. In addition to the Ed Spec, the design team was guided by the following principles:

- Improve site circulation and safety
- Minimize impact to school operations
- Phase implementation
- Compliance with Ed Spec
- Flexible program space
- Sustainable design strategies
- Cost effectiveness
- Create Community/School identity

This study includes a photographic and narrative assessment of the existing facility condition, including a preliminary evaluation of compliance with current building and life safety codes. Descriptive summaries and illustrations are provided for each alternative, followed by appendices that include analyses of cost, implementation schedule, and conformance with the Ed Spec.



## Findings

Through field observations and several School Study Committee meetings, it was determined that maintaining a two-building school has become a functional detriment to both faculty and students. Much time and effort is lost when planning the coordination of educational resources, administrative duties and bus circulation between the two buildings. Media center resources are split between the two buildings and there are several programs that are duplicated and require additional staff to operate, such as PE, food service and art. However, there is only one principal and one head custodian, and both divide their time and resources between the two buildings. Educationally, there are several lost opportunities in keeping a two-building school. There is little opportunity for role-modeling as the primary and secondary grades do not interact with each other. Neither building has an assembly space large enough to host the entire student body for pep rallies, athletic events or performances. The school community is essentially divided, which adversely affects school identity.

## Assessments

During the assessment of the overall school facilities, it was determined that due to inefficiencies in maintenance, program, staffing and education, the study team decided that maintaining a two-building elementary school is not consistent with the educational goals and needs of both William Paca/Old Post Road Elementary and Harford County Public Schools. After several explorations of both buildings the team presented several schematic options of both schools to a committee of HCPS staff, school administration, faculty and parents it was decided that due to the functional and site limitations of the Old Post Road facility the study team would proceed with their efforts focused on a one (1) school modernization of the William Paca Building. This decision was based on the information gathered during the existing conditions survey of the overall school building complex which revealed several building inadequacies regarding ADA and life safety code compliance, existing materials failures, structural systems, mechanical systems, etc.

### Old Post Road

The Old Post Road building is a result of several renovations and additions that no longer comply with current building codes and education requirements. This has created a labyrinthine layout and undersized educational spaces. The condition and layout of the building also adversely affects the program, learning environment and overall, for these reasons the design team felt that the solutions for this site would be a compromise to the current and future educational facilities.

### William Paca

The William Paca building suffers from undersized educational spaces and no air conditioning which makes for a difficult learning environment in the warmer months. The spatial limitations that both buildings suffer from do not provide the flexibility of program spaces which the team feels is an important part of today's learning environment.



## Proposed Design Options

The following proposed design options assessed the William Paca building and acknowledged that it currently has educational and functional limitations it does, however, provides several opportunities in creating multiple design options to meet the requirements described in the approved Educational Specification (Ed Spec). These design options were developed over several meetings and demonstrate these similarities:

### Buildings

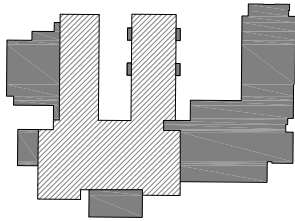
- The entire building will be brought up to Educational Specification requirements. This includes life safety, Americans with Disabilities Act (ADA), technology, room sizes and energy efficiency.
- Improved circulation by addition of cross corridors or extending existing hallways to allow multiple entrances into large areas (ex. cafeteria, gymnasium).
- All classrooms will have daylighting.
- New mechanical systems will provide a energy efficient building.
- New electrical systems.
- The entry control of gym is at one location to provide a secure control after hours during “after-school” events.
- Media center becomes available for after-hours/community use.

### Site

- Storm water management to be provided per Maryland Department of the Environment (MDE) and/or Harford County storm water requirements.
- New water and storm drain connections to proposed architecture. Connect to existing off site systems.
- Improved parking and bus/parent drop-off circulation.
- Two new site entrances to resolve traffic conflicts.
- New loading area and drive by kitchen.

## Proposed Design Options

In accordance with HCPS standards for feasibility studies, the study team developed four (4) design options to present in this study. These design options are summarized as follows:

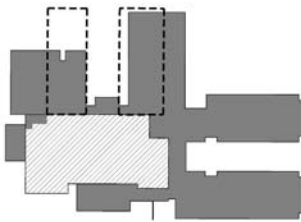


### Option A – Modernization

Modernization (Option A) is a systemic design option that includes the complete renovation and addition of building spaces and systems to bring the existing building into conformance with current building and life safety codes and to meet the requirements of the Ed Spec within the limitations of the existing building. Site design will address traffic patterns and athletic field requirements.

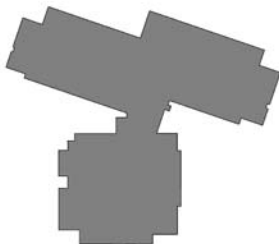
### Option A1 - Modernization

Modernization (Option A1) delivers the same design solutions as (Option A) but in a longer, phased construction delivery. This option is designed to allow a greater flexibility with making systemic changes ahead of the complete modernization of the facility.



### Option B – Modernization

Modernization (Option B) includes the demolition of the undersized academic wing, with replacement of those spaces and complete renovation of existing building spaces and systems to bring the entire building into conformance with current building and life safety codes and to meet the complete compliance with the Ed Spec. Site design will address traffic patterns and athletic field requirements.



### Option C – Replacement

Replacement (Option C) includes a design of a new facility to be in complete compliance with the Ed Spec, including square footage and proper spatial and educational relationships. Site design will address traffic patterns and athletic field requirements.

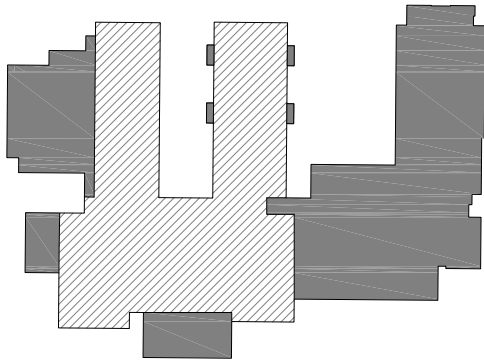


**Cost Analysis**

**LEGEND**



**Option A - Modernization**

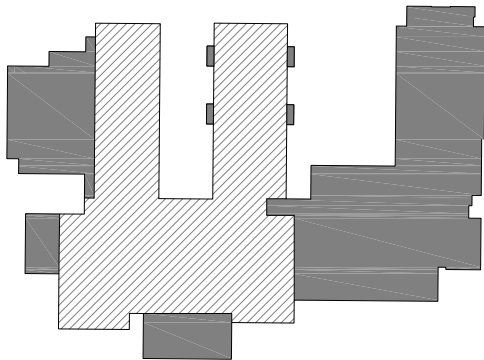


Area of Existing Building	51,834 GSF
Area of Demolition	57,177 GSF
Area of Modernization	51,834 GSF
Area of New Construction	96,517 GSF
<b>Total Area</b>	<b>148,351 GSF</b>
<hr/>	
<b>Total Estimated Const. Cost</b>	<b>\$41,702,657</b>

Construction duration will be 26 months.

Option A - Modernization is a systemic construction approach and Option A1- Modernization flexible construction approach including replacement and upgrades of the HVAC system, early site work, phased building additions and phased demolition.

**Option A1 - Modernization**



Area of Existing Building	51,834 GSF
Area of Demolition	57,177 GSF
Area of Modernization	51,834 GSF
Area of New Construction	96,517 GSF
<b>Total Area</b>	<b>148,351 GSF</b>
<hr/>	
<b>Total Estimated Const. Cost</b>	<b>\$45,314,589</b>

Construction duration will be dependent on the phasing options pursued. Below is a detailed break out of the options and the construction duration of each option.

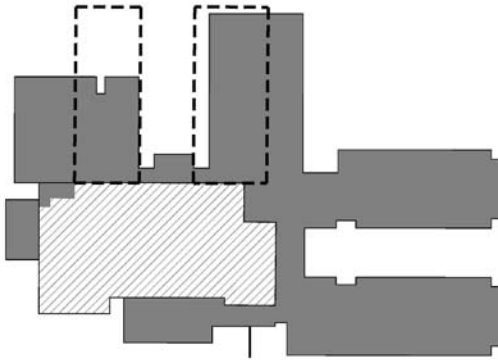
Phased Options	Construction Duration	Cost
HVAC Modifications, including Gable Roof	14 Months	\$7,759,352
Building Envelope	03 Months	\$1,779,118
Early Site Parking Modifications	04 Weeks	\$176,289
New Classroom Wing	12 Months	\$22,401,009
Additional/Renovation Work at Existing School	16 Months	\$12,479,782
Demolition of Old Post Building	02 Months	\$719,039

Cost Analysis

**LEGEND**



**Option B - Modernization**

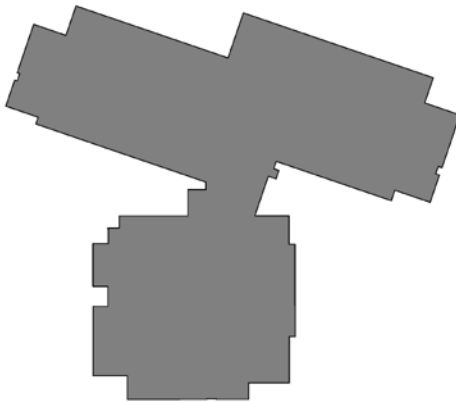


Area of Existing Building	51,834 GSF
Area of Demolition	82,513 GSF
Area of Modernization	26,498 GSF
Area of New Construction	118,903 GSF
<b>Total Area</b>	<b>145,401 GSF</b>

**Total Estimated Const. Cost \$41,960,372**

Construction duration will be 26 months.

**Option C - Replacement**



Area of Existing Building	not used
Area of Demolition (both schools)	109,011 GSF
Area of Modernization	not used
Area of New Construction	146,403 GSF
<b>Total Area</b>	<b>146,403 GSF</b>

**Total Estimated Const. Cost \$37,940,832**

Construction duration will be 22 months.



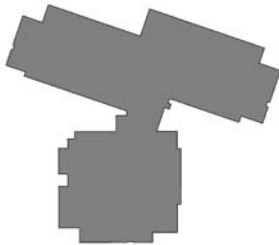
## Recommendations

During the exploration and development of the (3) schemes, the scope study team further refined the proposed design options according to the following criteria:

- Provides a phased implementation plan that will assist HCPS in providing a safe “on site” learning environment during the construction of a modernized or replacement school option.
- Provides a phased site improvements plan.
- A design solution that would facilitate an “Early Move Out” of the Old Post Road building complex.

With this criteria in mind the study team recommends that HCPS move forward with the implementation of **Option C - Replacement**.

## Option C - Replacement



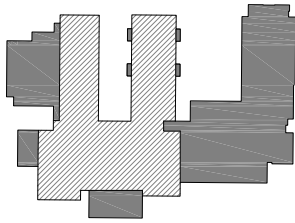
The replacement of William Paca / Old Post Road Elementary School (Option C) offers HCPS the greatest opportunity in providing a state-of-the-art educational facility in the shortest amount of time with the least overall financial output. The estimated cost of the proposed replacement facility is \$ 37,940,832 with a construction duration of 22 months. The advantages of Option C include:

- The opportunity for the existing school facility to remain open during construction of the replacement facility
- East-west orientation of the building for reduced solar heat gain
- An efficient, compact floor plan
- Optimal resolution to the current “on-site” traffic conditions
- Better utilization of the overall site once the existing buildings are demolished
- Complete compliance with the Ed Spec without spatial compromises

The disadvantage of this recommendation is that during the construction period the play fields will be used for construction staging and material storage. Additionally, due to the property location the construction entrance would be through the current school vehicle access and would have limited disruption of the current traffic patterns.

## Recommendations (continued)

While the design team has determined that the best design solution is Option C - Replacement, Option A1 - Modernization offers the opportunity for a phased implementation of incremental upgrades. This phasing plan includes early construction options that do not compromise the initial construction investment from the county that would later be removed for other construction options.



### Option A1 - Modernization

Option A1 provides HCPS with a more aggressive phasing opportunity by providing options ranging from limited site improvements to implementation of larger addition options. The estimated cost of the proposed modernization (Option A1) facility is \$45,314,589 with the construction duration of 48 months. This provides challenges for school operation during the construction period, and would need a detailed construction and egress plan to insure life safety of faculty, staff and students during this duration. However, this option also offers HCPS the opportunity to do a incremental phasing due to budgetary constraints that all schools systems incur in average economic times and most certainly in these trying economic times makes it even more difficult to provide needed improvements on all of the HCPS facilities. For those concerns the study team is offering a phased implementation plan for the modernization of the William Paca building for the BoE consideration as follows:

- HVAC upgrades and installation at a cost of \$7,759,352, this cost includes selective building upgrades to allow for new mechanical and electrical systems, this would include a new roof structure to allow for the routing of new duct work, that currently no space is provided for larger mechanical units.
- Building Envelope Improvements at a cost of \$1,779,118, this cost includes upgrades to the existing building to add higher performance windows and doors to insure the HVAC investment is operating at the intended design efficiencies.
- Construction of new academic wing at a cost of \$22,401,009, this cost includes the addition of a 42 classroom spaces, additional title one program spaces, teacher planning spaces and special education program spaces. This addition would facilitate in an earlier consolidation of the two school buildings into an entire “under one roof” school. Once this work is completed the Old Post Road building complex could be demolished to make room for the phased or complete site plan improvements.



## Harford County Public Schools: Mission, Vision & Beliefs

### Mission Statement

The Mission of Harford County Public Schools is to foster a quality educational system that challenges students to develop knowledge and skills, and inspires them to become life-long learners and good citizens.

### Vision Statement

Harford County is a community of learners where educating everyone takes everyone. We empower all students to contribute to a diverse, democratic, and change-oriented society. Our public schools, parents, public officials, businesses, community organizations, and citizens actively commit to educate all students to become caring, respectful, and responsible citizens.

### Belief Statements

- Every child is entitled to a safe and secure learning environment.
- All children learn best when schools respond to their needs.
- Parent and guardians are children’s first teachers, and their active involvement is vital to the educational success of their children.
- All individuals must take responsibility for their actions and hold themselves accountable for their results and outcomes.
- A successful school system establishes high expectations, seeks, supports and implements continuous improvement and responds to ever-changing educational needs.
- A partnership involving schools, families, community organizations, business and government contributes to the success of all students.
- All individuals should demonstrate diligence and integrity in their work, always respecting the worth, heritage, diversity and importance of others.
- All children should participate in the unique educational opportunities afforded by Harford County’s geography and history.
- Improve operational and instructional efficiency and effectiveness.
- The Planning and Construction Department will include the Green Building strategies in the design and construction of schools to improve energy management and efficiency.

### Every Student Feels Comfortable Going to School

Students who feel safe and comfortable in school will be more productive learners. The quality and maintenance of school facilities plays an important role in the level of comfort that families and their students have about school. Attending a school that meets the student’s personal and emotional needs provides comfort. A safe and secure school environment is essential for students to feel comfortable.





### Harford County Public Schools: Scope Study Goals

- Create a flexible facility to support a contemporary instructional program and enhance student success through the application of inter-disciplinary instructional approaches.
- Identify a vernacular which facilitates instructional groupings while fostering intra-cooperative educational experiences between students and teachers alike.
- Create an environment which illuminates the identity and image of the school within the community and encourages stability of the student population through exemplary educational programs and positive multi-cultural experiences.
- Identify a site layout which respects the surrounding community while providing a safe, and organized on-site pedestrian, automotive, and bus circulation pattern.
- Improve the security, operational, and maintainability aspects of the facility in order to increase resources available to the school staff and faculty in focusing on student success.
- Provide enhanced interior environmental quality levels through improved comfort systems and attractive finishes.
- Provide building improvements while maintaining instructional capability on-site throughout construction.
- Identify a capital improvement project which can provide the above goals on a compressed schedule and at optimum cost.



### William Paca / Old Post Road Elementary School : Mission & Vision

#### Mission Statement

Learning: Every Student, Everyday!

#### Vision Statement

Our school will work collaboratively with students, families and business partners to develop life-long learners who will become successful members in society. We will hold all members of our school community to the highest expectations and continue to raise academic achievement..

## William Paca / Old Post Road Elementary School

The 46.7 acre site is located at 2706 Philadelphia Road Abingdon, MD. The facility currently has a bus loop that shares entrances with parking and student drop-off. Site amenities include a baseball field, softball field which are both shared with the county’s Parks and Recreation Department, a multi-purpose play field and three (3) separate equipped play grounds.

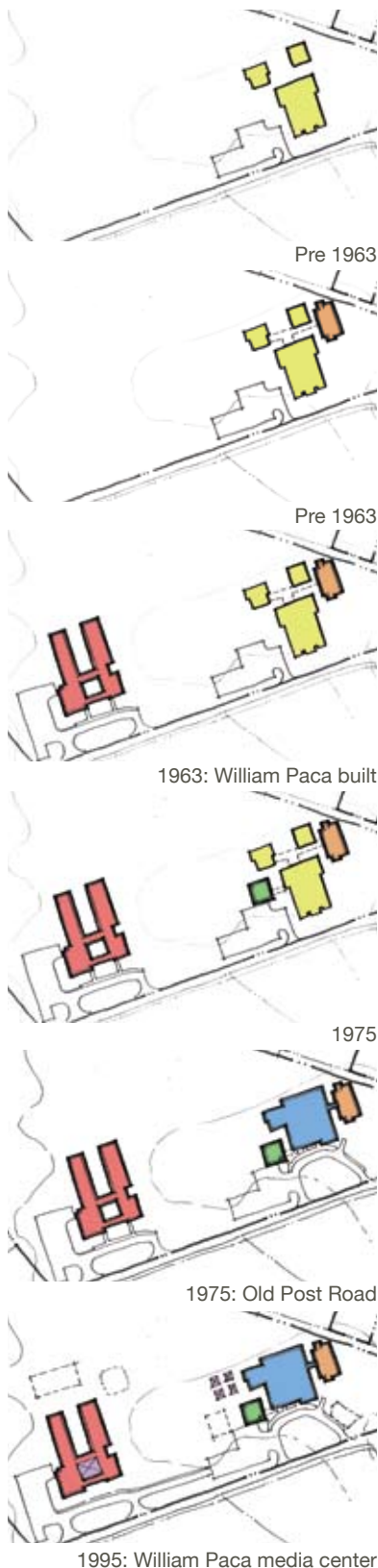
William Paca / Old Post Road Elementary School is a unique campus style school where the student population is divided into two separate building complexes on the same site. The buildings were constructed in several phases, beginning with portions of the Old Post Road building prior 1963, and William Paca to follow in 1963.

### Old Post Road Building Complex

Prior to 1963 there was an existing “open air” high school building occupying the site which was a series of three (3) buildings connected by an exterior covered walkway. Prior to 1963 the school was expanded with additional classrooms which currently used in the Old Post Road building. In 1975 the main section of the high school was demolished and the current configuration of the Old Post Road building complex were completed to include renovations to the existing portions that remained. The Old Post Road complex of buildings is 57,332 square feet which includes 4 portable classrooms at 864 sf each and a separate 4489 sf which houses Child Find and Pre-Kindergarten classes. The buildings of the Old Post Road complex currently not comply with Americans with Disabilities Act (ADA) requirements. It has also received select renovations to Heating, Ventilating, and Air Conditioning (HVAC). The buildings are not equipped with a complete fire protection system.

### William Paca Building

The William Paca building was built in 1963 and is 51,834 square feet. Though the school has not been significantly renovated or expanded since it was built, in 1995 there was infill of the existing internal courtyard for the addition of a modern media center and computer lab. The William Paca building currently does not comply with Americans with Disabilities Act (ADA) requirements. It has also received select renovations to Heating, Ventilating, and Air Conditioning (HVAC). The buildings are not equipped with a complete fire protection system.





## Part I - Site Conditions

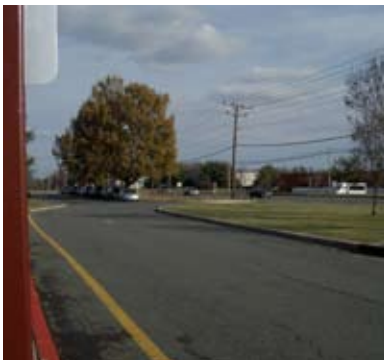


Site Fig. A

### Site Description

The William Paca / Old Post Road Elementary School is located at 2706 Philadelphia Road (Maryland Route 7) in Abingdon, Maryland. The site is located approximately one-quarter mile east from the intersection of Emmorton Road (Maryland Route 24) and Philadelphia Road (MD Route 7) in Harford County. The school itself is separated into 2 buildings which are situated on 46.7 acres+/- of land owned by Harford County Board of Education (BOE) (Site Figure A). The building on the western portion of the site is known as William Paca Elementary and serves intermediate grade children. The building on the eastern portion of the site is known as Old Post Elementary and serves kindergarten and primary grade children. A satellite parcel of land owned by the Board of Education exists across a 30' access easement on the eastern boundary of the principle property. This parcel of land is approximately 2.1 acres+/- of the overall 46.7 acre total. Maryland Real Property defines the site as Parcel 179 located on Tax Map 61 and is recorded among the land records of Harford County, Maryland in Liber 414 at Folio 464 and Liber 1546 at Folio 481.

The property is bounded to the south by Philadelphia Road, to the west by business and residential properties, to the north by commercial properties, and to the east by residential properties. The school grounds are currently improved with two school buildings, paved driveways and parking areas, three athletic fields, play structures and two hard court play surfaces. The northern and eastern portions of the property are covered by existing forest.



Site Fig. B

### Site Circulation and Parking

The school property has four access points along Philadelphia Road. The western two access points serve the William Paca Elementary School (Site Fig. B) and the eastern two access points serve the Old Post Elementary School.

At the western end of the property a four way signaled intersection controls access to the school and to the opposing commercial park located on Continental Drive on the south side of Philadelphia Road. This intersection provides right and left turn exit lanes, and an entrance lane on the school property. From Philadelphia Road, a signalized left turn lane into the site is provided. The next intersection on Philadelphia Road is 280'+/- east from the signalized intersection. This access point is for egress only with separate left and right turn lanes onto Philadelphia Road.

The first access point for Old Post Elementary is 570'+/- to the east of the previously described egress only intersection. This intersection is full access with separate egress and ingress lanes. The second access point is 250'+/- to the east and serves as the bus entrance into Old Post Elementary. This intersection is ingress only.



Site Fig. C



Site Fig. D

### Site Circulation and Parking (continued)

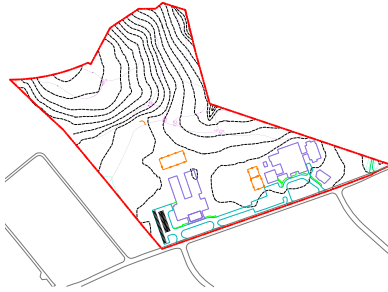
The circulation pattern on the school property is integrated from east to west and is intended to be one way. Bus traffic enters the site from the eastern most intersection in the morning for primary student drop off at Old Post Elementary and then proceed west to William Paca Elementary to drop off intermediate students. Parents also utilize the same circulation route that the buses use for student drop off in the morning. This sharing of the internal circulation by buses and automobiles creates a safety conflict. Currently accepted design standards for school circulation systems includes separate bus and automobile traffic for pedestrian safety considerations.

For student pick up in the afternoon, bus traffic is organized into two groups. A group of 15 buses assemble in front of William Paca Elementary (Site Fig. C), while a second group of 9 buses assembles in front of Old Post Road Elementary (Site Fig. D). After pickup is completed in front of the respective schools, the buses switch positions. The first group of 15 buses must make a left turn at the signaled intersection and travel east on Philadelphia Road and make a left turn into the eastern most entrance to Old Post Elementary School to complete student pickup. As the first group of buses completes this maneuver, the second group of 9 buses uses the internal driveway connection to assemble in front of William Paca Elementary School to complete student pickup. After pickup is completed, all bus traffic exits the site at the signaled intersection on the western edge of the property. The traffic signal is not controlled by the school during dismissal time such that all of the buses are not able to exit the school property during one light cycle.

There are two existing parking lots on the site for each of the respective school buildings. The parking lot supporting William Paca Elementary is located to the west of building along the western property boundary. This parking lot has approximately 63 parking spaces. The second parking lot supporting William Paca Elementary has approximately 70 parking spaces. Both parking lots provide parking for teachers, administration and service personnel as well as visitors and parents. The amount of currently existing parking is inadequate for the needs of school personnel and for the additional special education services provided by the school. The existing parking lots and most of the sidewalks are in good to fair condition.

### Zoning Information

The school property (Site Fig. E) is currently zoned R1, Urban Residential. The property is bounded on the west side by business zoned land, B2, and by residential zoned land, R2. To the north the property is bounded by commercial/industrial zoned land, CI. To the east the property is bounded by residential zoned land, R1.



Site Fig. E

### Bulk Zoning Regulations

Except as provided otherwise in this article, the following bulk regulations are applicable in an R-1 District for institutional uses.

Minimum lot size	2 acres
Maximum coverage by structures	65 %
Minimum width at front building restriction line	100 feet
Minimum setbacks for principal structures:	
Front lot line	50 feet
Rear lot line	80 feet
Side lot lines	40 feet
Corner side lot line	50 feet

### Site Soils

According to information provided by the USDA Harford County Soils Survey several soils exist on the property including:

- BeB – Beltsville series, moderate erodibility, moderate building constraints
- BeC – Beltsville series, moderate erodibility, moderate building constraints
- ChB2 – Chillum series, moderate erodibility, moderate building constraints
- JpC – Joppa series, moderate erodibility, severe building constraints
- LyB – Loamy and Clayey series, severe erodibility, severe building constraints
- LyD – Loamy and Clayey series, severe erodibility, severe building constraints
- LyE – Loamy and Clayey series, severe erodibility, severe building constraints

### Site Topography

Site topography generally slopes from west to east on the property. Two existing high points are located on the property. The first high point is at the rear of the property or the northern portion of the site. A hill with a high point of 130’ above sea level (ASL) is located along the northern property line. The ground slopes down from this high point to form a saddle (elevation 88’ ASL) and then gently rises toward Philadelphia Road or the southern portion of the site. The saddle falls away towards the eastern boundary of the property to a low point of 60’ ASL. A ridge of land generally runs parallel to Philadelphia road with a high point of 95’ above sea level. The existing school buildings are located on this ridge of land.



## Storm Drainage and Storm Water Management

There is no record of any stormwater management systems that were constructed when the original schools were completed. It is important to note that, in addition to the minimum standards and regulations imposed by Maryland Department of the Environment (MDE), Harford County has its own unique requirements for stormwater management. Generally, stormwater management requirements vary with the type and magnitude of imperviousness. It is anticipated that both water quality treatment and water quantity control will be required to be addressed as part of the redevelopment of the school site.

## Utilities

Water and sewer utilities currently serve both William Paca and Old Post Road Elementary. An existing water main from within Philadelphia Road supplies both existing school buildings. The existing water meters and service stubs may be removed and or sealed once construction activities are completed and replaced with new connections which will accommodate the newly designed school.

Currently, sewer services are provided from the existing Ha-Ha Branch sewer interceptor located to the east the property. Both school buildings utilize gravity sewer lines which exit the site from the isolated 2.1 acre parcel located to the east of the principal property. It is expected that any new school construction will utilize the existing sewer route to service the property.

## Floodplains, Wetlands, and Waterways

The principle site is not within the 100-year floodplain as delineated on FEMA Mapping. However, a small portion of floodplain exists on the isolated 2.1 acre parcel to the east of the principle property. See FEMA Map #24025CO258D. This floodplain is associated with the existing Ha-Ha branch tributary located to the east of the site. A drainage swale exists on the eastern boundary of the principle property. This area is contained within the 75' buffer of the Harford County Natural Resource District (NRD) and is not expected to be disturbed as part of the redevelopment activities on the site.

There are no visible wetlands or waterways in any currently developed/cleared areas of the Board of Education property. This information is subject to verification in the field at the time a survey is performed.



Site Fig. F

## Landscape, Trees and Forest Conservation

Landscaping within the developed area of the school property consists primarily of lawn and sporadic planting (Site Fig. F). There is approximately 19.3 acres+/- of existing forest located on the property. The forest is generally located along the northern and eastern property boundaries.

The redevelopment of the school property will require adherence to the State of Maryland and Harford County forest conservation regulations. Up to 4.2 acres+/- of forest clearing is permitted before any reforestation plantings would be required. It is anticipated that if a new school building is constructed that some forest clearing would be necessary. It is unknown at the time of the writing of this report how much clearing will be required if a new school building scenario is selected by HCPS. There are limited areas on the property where reforestation plantings, if required, could be accommodated. If improving the existing William Paca Elementary school building scenario is chosen, limited forest clearing is anticipated and therefore most likely would not require reforestation plantings. Adherence to state and local forest conservation regulations will be evaluated in detail once a development strategy has been selected by HCPS.



Site Fig. G

## Practice Fields/Athletic Fields/Athletic Courts

The school property has several areas of athletic fields, playgrounds, and hard court play surfaces. One 90' baseball diamond, one 60' baseball diamond, and one hard court play surface is located at the rear of the William Paca Elementary School building. The baseball diamonds and hard court play surface are in good condition.

A 60' diamond is located between the school buildings along with a playground area and an additional hard court play surface. Another playground area exists on the eastern side of the Old Post Elementary building. The baseball diamond, hard court play surface, and playground areas are in good condition (Site Fig. G).

In any eventual redevelopment scenario, the existing 60' diamond located between the schools and each of the playground areas located adjacent to Old Post Elementary will be required to be removed, relocated, and/or replaced.

## Site Educational Adequacy

### Functional Considerations

- Bus and vehicular traffic, no separation.
- Facility parking conflicts with parent drop-off.
- Inadequate parking for teachers, special education instructors, service personnel, and parents.
- Bus circulation for drop off and pick up inefficient and unsafe.





## Part II A - Old Post Road Building Complex

**Exterior Building**

OPR Fig. A

**Roof**

The roof is a combination of sheet membrane and asphalt built-up roof with ballast stone over a flat roof deck. Both roof membranes show signs of recent repair. The sheet membrane show signs of blistering and ponding. Openings, including skylights, drain vents, roof drains and through the roof penetrations, appear in good condition. There is a mix of roof drains and gutters. Gutters appear to have been added to accommodate the lack of overflow drains in the original design. The fascia and roof edging are in good condition. The flashing appears to be in good condition however the staff had indicated roof leaks that were not observed at time of report survey (OPR Fig. A).



OPR Fig. B

**Sidewalk Canopies**

Asphalt built-up roof with ballast stone over a flat roof deck with a mix of both open and closed soffit, the canopies are guttered with downspouts that spill directly on grade or sidewalk (OPR Fig. B).

**Exterior Walls**

The exterior is an uninsulated composite brick with CMU backup. The masonry and mortar appear in good condition; however repointing at about 10 percent of the walls is recommended. Flashing and weeps appear to be performing properly.



OPR Fig. C

**Exterior windows**

The windows are an uninsulated single pane metal frame system. Windows appear to be original and show sign of only minor repair over life of the window. For increased thermal performance and energy reduction these windows could be replaced (OPR Fig. C).

**Exterior Entrances and Storefronts**

The doors and hardware have been equipped with panic hardware devices to meet American Disabilities Act Accessibility Guidelines (ADAAG). The sidewalk approaches to the building do not meet ADAAG. Fire exit doors, frames, and hardware should be updated.



OPR Fig. D

## Interior Construction

### Ceiling

Typically, the finished ceiling is a suspended 2x4 acoustic panel and grid system. The panels are stained due to water damage, bowed, discolored and should be replaced with a suitable material (OPR Fig. D). There is a hard ceiling in the kitchen which is in good condition.

### Interior Partitions

Interior partitions are typically painted CMU. There are some movable interior partitions between classrooms that are unused and provide poor acoustic barriers (OPR Fig. E). Most partitioning is in good condition, but requires patching and painting. Folding partitions that separate the gymnasium and cafeteria appear to be in good condition but are difficult to move.



OPR Fig. E

### Floors

Corridor, restroom, and kitchen floors are ceramic tile. Other rooms are typically asbestos floor tiles or vinyl composite tile (VCT) which should be replaced. The media center has carpeting. All typical flooring is in good condition. The stage floor is wood and is in need of reconditioning. The gym floor is wood and should be reconditioned. The tech-ed wood floor is in poor condition and not required by program.

### Doors/Hardware

Classroom doors are in poor to fair condition and the hardware is not ADAAG compliant.

### Restrooms

Restrooms are adequately sized but are not ADAAG compliant (OPR Fig. G). Metal toilet partitions show signs of denting, some rust, and paint chipping.



OPR Fig. F

### Casework and Equipment

Classroom casework is generally in good condition, hardware and hinges are in good working condition, the plastic laminate finish shows signs of wear. Faucets in casework do not comply with ADAAG.

## Structural System

The William Paca/Old Post Elementary School consists of two separate building complexes located on the same site. A limited structural condition assessment was performed for both building complexes and is discussed below individually.

The Old Post Road complex consists of three buildings built prior to 1963 with a major addition in 1975. The 1975 addition is connected directly to two of the three pre-1963 buildings. The third pre-1963 building is connected to the 1975 addition with an exterior canopy. All of the buildings in the complex are single story structures.

### Pre-1964 Buildings

The roof construction of the existing 4-classroom building consists of wide flange steel beams and girders with a metal roof deck. The steel beams and girders are supported by a combination of masonry bearing walls and steel columns. The roof construction of the existing 8-classroom building consists of open-web steel joists with a poured gypsum roof deck. The steel joists are supported by masonry bearing walls.

The pre-1964 buildings are built with a combination of a slab on grade and a crawl space. The 4-classroom building appears to have been constructed with a slab on grade and the 8-classroom building appears to have been constructed with a crawl space. The first floor framing over the crawl space is a panelized precast concrete block assembly system with a poured in place concrete topping.

Foundations for the buildings consist of concrete spread footings at isolated columns and continuous concrete wall footings at masonry bearing walls and exterior walls.

### 1975 Addition

The roof construction for the majority of the 1975 addition consists of open-web steel joists at approximately 4'-0" on-center maximum with a 2 1/2" poured gypsum roof deck with 1/2" formboard with bulb tee sub-purlins (for a total roof deck thickness of 3"). The joists are typically supported by masonry bearing walls. At some locations where bearing walls terminate the roof joists are supported by structural steel wide flange girders and steel columns.

The high roof construction of the Gymnasium and Cafeteria consists of long-span open-web steel joists with cementitious wood fiber roof plank with bulb tee purlins spanning between the joists. The total plank thickness is indicated to be 3". The joists are supported by masonry bearing walls.

## Structural System (continued)

### Existing Conditions

Based on our limited visual observations, the existing structure appears to be in fair structural condition. We did not observe any major signs of distress which would indicate a significant structural problem but did observe some items which, if left unattended, could lead to future problems. These items are noted as follows:

OPR Fig. G



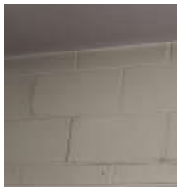
Cracks in the brick veneer were observed in several locations on the exterior of the building. The cracks were generally not large but at some locations, corroded steel reinforcing was observed in the cracked and deteriorated horizontal mortar joints. The corroded steel appeared to be joint reinforcing at one location and the horizontal leg of a steel angle lintel at another location (OPR Fig. G & H).

OPR Fig. H



Cracks in the masonry (CMU) bearing walls were observed at several locations inside the building. The cracks observed were horizontal, vertical and diagonal. The largest observed cracks were diagonal indicating potential differential settlement as the cause of the crack (OPR Fig. I).

OPR Fig. I



Signs of moisture infiltration through the exterior masonry walls were observed along two walls at the rear of the 1975 addition. Recently repainted inside wall surfaces were observed to have the paint bubbling and beginning to peel off of the wall surface. The school's chief custodian indicated that this was an ongoing problem and the walls were recently repainted because of the moisture infiltration.

OPR Fig. J



Corrosion of the roof framing was observed at the pre-1963 4-classroom area of the structure. The metal roof deck was observed to have areas of rust on the underside of the roof deck. Rust was also observed on the some of the structural steel roof framing. Upon review of the roof in this area, the asphaltic membrane roof appeared significantly faded and lines of joint patches were visible, suggesting signs of previous roof leaks which have resulted in corrosion of the roof deck and steel framing. It is difficult to assess the full extent of the corrosion of the roof in this limited survey, as the top surface of the roof deck is not visible.

OPR Fig. K



Corrosion of the roof framing was observed at the three small canopies at the pre-1964 8-classroom area of the structure. Significant rust was observed on the underside of the perimeter steel beams of the canopies. Peeling paint was also observed on the underside of the roof deck (OPR Fig. J).

Several of the tube steel columns at the kindergarten canopy were observed to have been significantly corroded at the base of the column (OPR Fig. K). An expansion joint material appears to have been placed around the columns, which has deteriorated and a gap has formed between column and the surrounding concrete slab allowing water to collect at the base of the column and corrode the steel. Given the location of the corrosion at the base of the columns, it would be difficult to remediate and would likely need to be replaced.



OPR Fig. L



OPR Fig. M

## Mechanical Systems

The overall condition of the mechanical system is fair. The majority of the building is served by systems and equipment originally installed at the time of construction. The systems and equipment are well-maintained; however, they are well beyond their average life expectancies.

The location of the mechanical equipment room is relatively central to the building as it currently exists which allows the piping distribution to be reasonably efficient.

## Heating System

The heating plant generation equipment consists of two (2) equally-sized Scotch marine fire-tube boilers (OPR Fig. L). The boilers are hot water type utilizing No. 2 fuel oil as the energy source. The boilers are original, installed in 1964.

The existing boilers appear to be in good shape; however, they are beyond their anticipated life expectancy and are recommended to be replaced.

## Heating Distribution System

The original heating and cooling water pipes are original. The condition of these pipes is unknown and is largely dependent upon water chemistry and water treatment history.

## Cooling System

The cooling plant consists of two (2) equally-sized air-cooled chillers (OPR Fig. M). The chillers were replaced with rotary screw type air-cooled chillers manufactured by the Trane Company.

The original chillers have been replaced. The chillers are in good condition and can be reused. It is doubtful that any additional capacity could be provided by this plant.

## HVAC Systems

The systems for the various areas are:

- Classrooms: Multi-zone Air Handling Units and Vertical Unit Ventilators
- Multipurpose Room: Two (2) Heating and Ventilating Units
- Cafeteria: Single Zone Air Handling Unit
- Office/ Administration Suite: Multi-zone Air Handling Unit

The existing air distribution systems are not very energy-efficient, nor do they provide temperature and humidity control or filtration needed for good indoor air quality.

## **Mechanical Systems (continued)**

### **Automatic Temperature Control System**

The building is locally controlled through a pneumatic automatic temperature control system.

### **Electrical System**

A new upgraded electric service will be needed as a result of the increased demand resulting from the new air conditioning equipment. Due to ceiling systems needing to be replaced to accommodate new mechanical systems, it is recommended that existing lighting systems be replaced with new energy-efficient type. A new BGE transformer will be required. A new 480-volt switchboard will also be required.

### **Plumbing Systems**

**Incoming Water Service:** The building is served by a 3-inch public cold water service to serve the domestic water needs of the facility. A hot water storage tank with an internal heat exchanger utilizes boiler water to generate domestic hot water.

### **Fire Protection System**

The building currently is not protected by a full coverage fire sprinkler system. If the school is revitalized, modernized, or replaced, a full coverage sprinkler system will need to be installed in order for the building to be code compliant. The existing water service is not adequate to supply a sprinkler system. A new water service will need to be installed to accommodate a sprinkler system.



**Part II B - William Paca Building****Exterior Building**

WP Fig. A



WP Fig. B

**Roof**

Asphalt built-up roof with ballast stone over a flat roof deck. The roof membrane shows signs of recent repair. In hot weather the asphalt leaks on the exterior and interior of the building (WP Fig. A). Openings, including drain vents, curbs and roof hatch and through the roof penetrations, appear in good condition. There is a mix of overflow drains and scuppers. Scuppers have been added to accommodate the lack of overflow drains in the original design. The fascia and roof edging are in good condition. The flashing at cants has been replaced but the original expansion joints remain and should be replaced.

**Exterior Walls**

The exterior is an uninsulated composite brick with CMU backup. The masonry and mortar appear in good condition; however repointing at about 10 percent of the walls is recommended. Flashing and weeps seem to be performing properly.

**Exterior Windows**

The windows is an uninsulated aluminum storefront system (WP Fig. B) . The windows provide adequate light and air into classrooms, but show signs of air and water leakage. For increased thermal performance and energy reduction these windows should be replaced.

**Exterior Entrances and Storefronts**

The doors and hardware are equipped wit panic devices to meet American Disabilities Act Accessibility Guidelines (ADAAG). The storefronts are single pane aluminum storefront units and should be replaced. Fire exit doors, frames, and hardware should be updated.





WP Fig. C

## Interior Construction

### Ceiling

Typically, the finished ceiling is a suspended 12"x12" or 24"x24" acoustic panel and grid system (WP Fig. C). The panels are bowed and dull and should be replaced with a suitable material. The grid is structurally stable but is discolored. There is a hard ceiling in the kitchen which is in good condition.

### Interior partitions

Interior partitions are typically painted CMU, the partitions along the classroom corridors are stud infill with drywall facing (WP Fig. D). Most partitioning is in good condition, but requires patching and painting.



WP Fig. D

### Floors

Corridor, restroom area and kitchen floors are ceramic tile. Other rooms are typically asbestos tiles or VCT tiles and should be replaced (WP Fig. E). The media center has carpeting. All typical flooring is in good condition. The stage floor is wood and is in need of reconditioning. The gym floor is VCT and should be reconditioned.



WP Fig. E

### Doors/hardware

Classroom doors are in poor to fair condition and the hardware is not ADAAG compliant.

### Restrooms

Restrooms are adequately sized but do not comply with ADAAG (WP Fig. F).



WP Fig. F

### Casework and Equipment

Classroom casework and science lab casework and equipment are in poor condition and should be replaced. Science labs were renovated in 1995 and do not meet current requirements.

## Structural System

The William Paca/Old Post Elementary School consists of two separate building complexes located on the same site. A limited structural condition assessment was performed for both building complexes and is discussed below individually.

William Paca Building is a one story structure, with the original portion built in approximately 1963 and an addition constructed in approximately 1995.

### 1963 Structure

The majority of the roof construction consists of 7 ½” deep metal roof deck spanning primarily between masonry bearing walls. In some locations the roof deck spans between steel beams which are supported by steel columns. The metal deck supports a built-up roof with rigid insulation and stone ballast. The 7 ½” metal roof deck typically spans 20 to 30 feet between supports.

The high roof construction of the Gymnasium/Multi-Purpose Room consists of “Insulrock” panels, a cementitious wood fiber plank, with bulb tee sub-purlins, spanning between wide flange steel purlins supported by rigid frame steel bents. The rigid bents are approximately 20’-0” on-center. The roof of the Gymnasium/Multi-Purpose Room is approximately 6 feet higher than the remaining low roof of the original building.

Majority of the original building is constructed with a slab on grade reinforced with welded wire fabric. A portion of the original building, however, is constructed with a crawl space. The crawl space is typically located below the corridors at the administrative area and at the kitchen. The first floor framing over the crawl space is a panelized precast concrete block assembly system known as “Dox” Plank, with a poured in place concrete topping. Based on existing drawing information, the “Dox” plank is 6” thick and has a 2” concrete topping for a total floor structure thickness of 8”.

Foundations for the building consist of concrete spread footings at individual columns and continuous concrete wall footings at masonry bearing walls and exterior walls.

### 1995 Addition

A Media Center addition was added in 1995 which filled in an enclosed courtyard in the administrative area. Roof framing for the addition consists of open web steel joists at 5’-0” on center maximum with 1-1/2” galvanized metal roof deck, supported by structural steel wide flange beams and girders and tube steel columns. The roof of the addition is approximately 6 feet higher than the adjacent low roof of the original building which surrounds the addition.

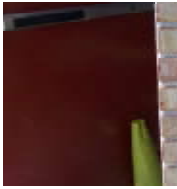
The floor slab consists of a 5” concrete slab on grade reinforced with welded wire fabric. Foundations for the addition consist of a shallow spread footing system with isolated concrete column footings and continuous concrete wall footings.

## Structural System (continued)

### Existing Conditions

Based on our limited visual observations, the existing structure appears to be in fair to good condition. We did not observe any signs of distress which would indicate a structural problem, and, at this time, do not anticipate any structural modifications other than those required for the proposed additions and renovation. The masonry walls and the brick all appear to be in generally good condition. A minimal amount of cracks were observed in the brick veneer.

WP Fig. G



There were a few maintenance items, that although they are not a problem now, could develop into one if left as is.

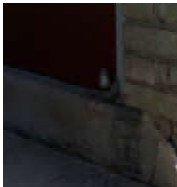
A vertical crack in the brick veneer was observed near a corner of the gymnasium (WP Fig. G). It appears a previous attempt was made to repair the crack by filling it in with mortar but the crack is still open in some locations which could allow water to migrate through the crack resulting in additional damage to the brick veneer through repeat cycles of freezing and thawing.

WP Fig. H



The steel columns of the rigid bents in the gymnasium are partially exposed at the exterior face as the brick veneer does not continue past the exterior column face (WP Fig. H). The columns appear have been recently painted and generally appear in good condition. However, along the vertical joint between the brick veneer and the exterior exposed column face, some signs of corrosion are visible on the column face where the caulked joint has deteriorated. We recommend the corrosion be removed from the column surface and the exposed column face be repainted. A new caulked joint should be placed along the vertical interface between the brick veneer and the column.

WP Fig. I



At several locations along the exterior wall of the building, cracks in the above grade concrete foundation wall were observed. The cracks generally did not appear to be significant as they did not extend up through the masonry wall above. However, the cracks should be monitored for future deterioration (WP Fig. I).



WP Fig. J

Several of the tube steel columns at the canopy were observed to have significantly corroded at the base of the column (WP Fig. J). An expansion joint material appears to have been placed around the columns, which has deteriorated and a gap is visible between column and the surrounding concrete slab. Water is able to infiltrate collect in this space between and column and the concrete resulting in corrosion of the below grade portion of the columns.



The vertical expansion joints in the brick veneer where the classroom wings meet the rest of the building have deteriorated and are likely in need of replacement (WP Fig. K).

WP Fig. K



WP Fig. L

## Mechanical Systems

The original building was constructed in 1964 and consists of approximately 54,450 square feet. In 1997, a Media Center was constructed within the existing courtyard. The building is single-story, with pipe tunnels located under the main corridor. The building has two (2) typical double-loaded corridor classroom wings located parallel to each other. The building wall system is primarily brick/block construction with single glazed windows, which has a poor insulating factor, is susceptible to excessive infiltration, and if air conditioned—could create condensation on surfaces. The Media Center Addition included air conditioning.

The majority of the building appears to have vinyl asbestos floor tiles. There also appears, based on visual inspection only, of asbestos insulation, as a minimum on the fittings, located on the heating water piping distribution system located in the crawl space. Additional hazardous materials could exist within the facility.

The overall condition of the mechanical system is fair. The majority of the building is served by systems and equipment originally installed at the time of construction. The systems and equipment are well-maintained; however, they are 40 years old and well beyond their average life expectancies.

The building has limited ceiling space (for installing large duct systems) and structure (for supporting heavy rooftop units).

## Heating Plant

The heating plant generation equipment consists of two (2) equally-sized cast iron boilers (WP Fig. L). The boilers are hot water type utilizing No. 2 fuel oil as the energy source. The boilers are cast iron, Mills 450, as manufactured by H. B. Smith. The boilers are original, installed in 1964.

The existing boilers appear to be in good shape; however, they are beyond their anticipated life expectancy and are recommended to be replaced.

## Mechanical Systems (continued)

### Heating Distribution System

Two (2) hydronic zones, each consisting of a primary and standby pump, serve the building's terminal heating units (e.g., convectors, baseboard radiation, unit heaters, unit ventilators, heating and ventilating units, etc). The systems for the various areas are:

- Classrooms: Vertical Unit Ventilators
- Multipurpose Room: Two (2) Heating and Ventilating Units
- Cafeteria: Vertical Unit Ventilators
- Office/ Administration Suite: Fan-Coil Units

The original heating water pipes, with distribution mains in a pipe tunnel/crawl space, are 40 years old. The condition of these pipes is unknown and is largely dependent upon water chemistry and water treatment history. The pipe tunnel, even though accessible, would not be recommended for installing new piping systems unless absolutely necessary, due to lack of overhead ceiling space.

### Heating Terminal Units/Heating and Ventilating Units

The existing units are original to their construction phase and are in fair to poor condition. Most of the finned tube radiation units in the classrooms are located behind the perimeter casework in a chase/cavity space, making access difficult for repairs and service.

### Automatic Temperature Controls

The building is locally controlled through a pneumatic automatic temperature control system.

### **Electrical**

A new upgraded electric service will be needed as a result of the increased demand resulting from the new air conditioning equipment. Due to ceiling systems needing to be replaced to accommodate new mechanical systems, it is recommended that existing lighting systems be replaced with new energy-efficient type. A new BGE transformer will be required. A new 480-volt switchboard will also be required.

### **Plumbing Systems**

**Incoming Water Service:** The building is served by a 3-inch public cold water service to serve the domestic water needs of the facility. A hot water storage tank with an internal heat exchanger utilizes boiler water to generate domestic hot water.

### **Fire Protection System**

The building currently is not protected by a full coverage fire sprinkler system. If the school is revitalized, modernized, or replaced, a full coverage sprinkler system will need to be installed in order for the building to be code compliant. The existing water service is not adequate to supply a sprinkler system. A new water service will need to be installed to accommodate a sprinkler system.



## Overview

William Paca / Old Post Road Elementary School consists of two, single-story buildings with structures consisting of a steel frame roof supported by steel framing located along the exterior walls, and masonry construction along the interior corridors.

The buildings are not sprinklered, and the students exit the building via non-rated interior corridors. At the William Paca building, the exterior walls consist of full-height windows which are operable at the lower level.

In both structures the toilet facilities are provided by ganged toilet rooms.

## Life Safety Code Issues

William Paca / Old Post Road Elementary School complies with the building codes enforced at the time it was constructed, however the school is not in conformance with the present codes.

The major issue is the lack of a sprinkler system. The present code states that a school must have a sprinkler system unless one of the following is provided:

1. All classrooms or areas where students gather must have a direct exit to the exterior of the building.
2. The interior exit corridor must be fire rated and all doors to the corridor must also be rated and be self-closing.

Options A, B and C presented in this report include the installation of a sprinkler system.

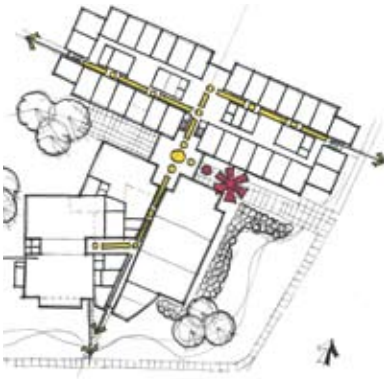
## ADA Code Issues

Our review of the building indicates that the building entrances are not accessible due to lack of ramps and door sizes. The administration area, classroom toilets, and gang toilet rooms are not accessible.

Options A, B and C presented in this report address these issues.







### Design Goals

During the exploration and development of the (3) schemes, the scope study team further refined the proposed design options according to the following criteria:

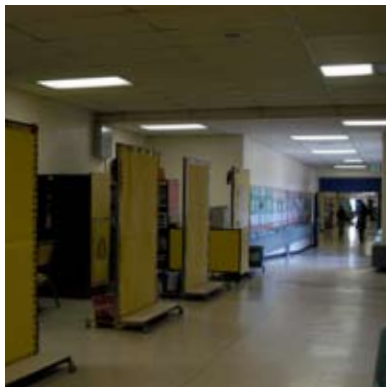
- Offers phasing solutions to meet the HCPS budget restrictions.
- Provides a phased implementation plan that will assist HCPS in providing a safe “on site” learning environment during the construction of a modernized or replacement school option.
- Provide a phased site improvements plan.
- A design solution that would facilitate an “Early Move Out” of Old Post Road building complex.



Old Post Road building floor plan

### Inadequacy of the Old Post Road Building Complex

The existing conditions survey of the Old Post Road building revealed several inadequacies regarding existing materials, structural systems, mechanical systems, etc. The building is a conglomeration of several additions that, when built, satisfied building codes but are now do not comply with current building codes and education requirements. The condition and layout of the building also adversely affects the program, learning environment and overall, for these reasons the design team felt that the solutions for this site would be a compromise to the current and future educational facilities.



Classroom in corridor



Storage overflow in restroom



Classroom with no natural light

- **Site Location** - The building complex is located in the most eastern section of the site close to the property lines which prevent the structure from expanding in the north, south and east direction and would constrain site development to the western direction. This condition would place parking and site circulation between the school building and play fields and poses potential safety concerns for students and staff.
- **Site Circulation** - The existing traffic signaled entrance on Philadelphia Road (Rt. 7) is located on the opposite end of the site from the current Old Post road entrance. Therefore, location is not ideal for building additions or vehicular circulation.
- **Building Circulation** - Old Post Road is already collection of outdated building additions with few clear circulation paths to determine the locations of new additions. Other circulation failures: area A contains a classroom that is accessed through a restroom and students must exit the main building to access the art room/early childhood intervention rooms.
- **Non ADA compliant** - Old Post Road is currently does not meet the ADAAG codes, to include all of the restroom facilities, major building entries and site access.
- **Moisture Problems on North Wall of Building** - On the north side of the building there is no moisture protection in the wall between the brick facing and the concrete masonry wall structure. This lack of a moisture barrier has caused leaking, paint staining and a building up of mold and mildew.
- **Insufficient Access to Natural Light** - Several of the classrooms are interior classrooms that receive no natural light.

After an extensive analysis of the existing conditions and several discussions with staff, faculty and county members, the study team recommends that the Old Post Road Building Complex be removed from consideration in future modernization/renovation designs.

### Option A + Option B: Scope of Work

Each of the modernization schemes share a common criteria's that are listed below:

#### Architectural

- The entire building will be brought up to Educational Specification requirements. This includes life safety, Americans with Disabilities Act (ADA), technology, room sizes and energy efficiency.
- Improved circulation by addition of cross halls or extending existing halls to allow multiple entrances into large areas (ex. cafeteria, gymnasium).
- All classrooms will have daylighting.
- Media center becomes available for after-hours/community use.
- Improves parking and bus/parent drop-off circulation.
- New mechanical systems will provide a energy efficient building.
- New electrical systems.
- Plan provides student learning areas in daylight areas.
- The entry control of gym is at one location to provide ease of control after hours during "after-school" events.

#### Mechanical

To achieve LEED Silver Certification, the building and systems efficiency must exceed ASHRAE 90.1 Energy Requirements. High efficiency equipment, control strategies, and system designs need to be implemented in concert with the building's architecture. The system shall be designed for either an early design phase or as part of a single project alternative.

#### Alternatives

There are two high efficiency type design alternatives that are recommended to be considered. The first is a ground loop Geothermal thermal heat pump system. This system has a higher initial cost, but will consume less energy, thus, maximizing LEED Energy-efficiency points. The second is to use a high efficiency conventional central heating and cooling plant. The cooling plant will consist of multiple high efficiency, variable speed drive water-cooled centrifugal chillers with associated condenser water system. The heating plant will consist of multiple high efficiency condensing type fire tube boilers (Aerco or Cleaver Brooks) controlled in modular fashion. It is recommended the conventional system will serve a 4-pipe fan coil unit system used in conjunction with a dedicated outdoor air heat recovery system.

### Mechanical (continued)

- **Option 1: Four-pipe Fan Coil Unit System with Dedicated Heat Recovery Ventilation Units**
  - Individual vertical or horizontal fan-coil units with ducted supply air system to ceiling supply air diffusers will be provided for each room. These units will be 100% recirculating air type with heating and cooling coils controlled to maintain the desired environmental conditions.
  - Heat Recovery Ventilation Air Units (100% outside air/ dedicated outdoor air system (DOAS) ) will be used to dehumidify and heat the minimum amount of outside air as determined by the requirements set forth by ASHRAE Standard 62-2004 and the Educational Specifications. This tempered outside air will be directly injected into each classroom and/ or classroom fan-coil unit. Relief air will be brought back to the heat recovery unit for energy reclamation. Multiple heat recovery devices inside these units (heat wheels, flat plate heat exchangers) will be employed to provide the necessary conditioning of the outside air as well as supply and relief air fans and filter banks. These units will be located at the ends of a new gabled roof structure or in roof penthouses.
  - Under the modernization alternative, the HVAC System may be installed prior to the renovation under a systemic replacement project. The system design shall provide the flexibility to meet the current and future loads and provide flexibility for future renovation of the building during the modernization phase of the project so as to minimize the amount of rework needed.
  - The fan coil option can be served by either the conventional chiller-boiler plant, or by a geothermal system using water-to-water heat pumps. In a hybrid solution, the fan coil unit system can be served by a central plant that uses boilers, chillers, and/or water-to-water heat pumps to create chilled water and heating water.
- **Option 2: Geothermal Heat Pump System with Dedicated Heat Recovery Ventilation**
  - Geothermal heat pumps will be used in conjunction with 100% outside air heat recover units. Vertical units located in closets are recommended at each classroom; or mechanical mezzanines located in the attic space structure are recommended. Geothermal heat pumps shall be direct digitally controlled with wall-mounted temperature sensors. All geothermal heat pumps shall utilize a condensate drain collection system. This system requires a large area for the earth heat exchanger field. Water-to-water heat pumps will be utilized to generate dual temperature water (chilled or low temperature heating) to serve the ventilation air units.

### Mechanical (continued)

- Geothermal heat pumps take advantage of using the earth as the loop's heat sink. Approximately 5'-0" below the earth's surface, a relatively constant 55 degree F temperature is maintained. Due to the extended temperature operating range, the piping system must be insulated and the loop must be provided with an antifreeze solution or be provided with a supplemental condensing boiler.
- The proposed system utilizes the vertical well concept with plastic tubing installed in a u-bend configuration within a +/- 400 to 450 foot deep well which is filled with a grout-type material. Each vertical well will be capable of +/- 1-1/2 to 2 tons of heat exchange depending on soil and grout thermal conductivities. Based on the total building area, 300 vertical bore holes are anticipated.
- Variable speed pumping and zone valves to separate areas of the building will be utilized to minimize pump energy.
- Based on the need to replace the existing boilers, fuel oil tank, and fuel oil piping, in conjunction with sufficient site for an earth heat exchanger, the geothermal premium is minimized and provides many advantages to the Owner, including energy savings, reduced service and maintenance cost, superior indoor air quality, and the ability to abandon, rather than replace, the existing underground fuel oil tank and associated piping system.

### Building Automatic Temperature Controls / Energy Management System

The existing building currently utilizes a local pneumatic control system. It is recommended that the building be provided with an upgraded Johnson Metasys Web-Based Automation System and be tied into the County Energy Management System. It is recommended that the system have full direct digital controls, including space terminal unit controls, which is consistent with the county Standard. Terminal unit controls shall be electric/electronic actuation. All control and monitoring points shall; be consistent with the County's current Standards and shall be reviewed with the Facilities Management Department during Design.

Automatic Temperature Controls shall be capable of operating per the sequence of operation, including when the Energy Management System is manually overridden.

### Mechanical (continued)

The Basic Design Criteria will be as follows:

1. Cooling Mode:
  - Outdoor Temperature: 95 deg F DB, 78 deg F WB
  - Indoor Temperature: 75 deg F DB, 65% RH or less
2. Heating Mode:
  - Outdoor Temperature: 10 deg F DB
  - Indoor Temperature: 70 deg F DB
3. Chilled Water System (at 95 deg F Ambient):
  - 45 deg F Supply Water Temperature
  - 60 deg F Return Water Temperature
4. Heating Water System (at 10 deg F Ambient):
  - 140 deg F Supply Water Temperature
  - 120 deg F Return Water Temperature
5. Ventilation Rates (ASHRAE Standard 62-200):
  - 15 CFM per person minimum – Classrooms
  - 20 CFM per person minimum – All Other Ares
6. Water Source Heat Pump:
  - Geothermal Loop - 25 deg F to 110 deg F Water Temperature

- **Central Heating Plant:** The building central heating system shall be energized to operate whenever outside air temperatures are 65 degrees F or less. Through sequencing software, the boilers and associated boiler circulating water pump shall be staged in lead-lag fashion to maintain system supply water setpoint. Boiler lead-lag control shall be rotated through the sequencing software.

The heating water temperature supply shall be reset (linear type) based on outside air temperature.

- **Central Chilled Water Plant:** The building central chilled water system shall be energized to operate whenever outside air temperatures are 50 degrees F or above. When activated, the chiller and its associated chilled water pump shall be energized. The chiller shall be controlled through its internal control panel to maintain discharge evaporator water temperatures.
- For Constant Volume Air Handling Units, a room temperature sensor will modulate the associated air handling unit's cooling coil valve and outside air economizer controls to provide the necessary cooling. When heating is required, the room thermostat first modulates the unit's hot water preheat coil valve. If additional heat is required, the thermostat shall modulate the unit's heating coil valve in series with the preheat coil valve.

### Mechanical (continued)

- Fan-Coil Units will be controlled by room temperature sensors. Cooling coil and heating coil control valves shall modulate to maintain room temperature set point.
- Heat Pump Units will be controlled by room temperature sensors. Reversing valves shall be positioned to either heating or cooling and the compressor will cycle (on/off) to maintain room temperature setpoint.
- Dedicated Outdoor Air Units will be controlled by temperature and humidity sensors. The total heat, enthalpy type heat recovery wheel shall temper and [retreat the outside. The dehumidification/cooling coil control valve shall maintain 52 degrees F dewpoint temperature and the sensible reheat heat recovery device will be controlled by a discharge air sensor to provide dry, neutral temperature air to the occupied space.

### Plumbing

#### Incoming Water Service:

The building is served by a 3-inch public cold water service to serve the domestic water needs of the facility. A hot water storage tank with an internal heat exchanger utilizes boiler water to generate domestic hot water.

### Electrical

- Replace primary switchgear and all lighting and power panels and feeders.
- New 277/480 volt panel boards will serve lighting and mechanical loads.
- Step-down transformers, located strategically around the building, will feed 120/208 volt panels for computer power.
- There will be dedicated receptacles in classrooms and offices that will be connected to the computer grade power panels.
- Replace all interior lighting.
- Install a lighting control system that employs, as a minimum, occupancy sensors and relay panels for better control of lighting.
- Consider a networked lighting control system.
- Provide a new emergency generator.
- Replace all electrical devices (receptacles, switches, junction boxes, data/phone outlets, etc.).
- All branch circuit wiring will be replaced.
- Existing conduits will be reused if feasible and in good condition.
- New conduits will be concealed in new walls. Where existing walls remain surface metal raceway will be used to conceal wiring.



### Fire Protection System

- New fire service line will be supplied from county mains.
- The sprinkler service and all zone valves will be located in a new fire sprinkler room.
- Multiple sprinkler zones will be provided for the building.
- The sprinkler system will be hydraulically designed to minimize pipe size requirements and to provide a more economical distribution system for the building.
- A hydrant flow test must be performed to verify the necessity of a fire pump.

### Fire Alarm System

A complete new digital, fully addressable fire alarm system will be installed throughout the building.

### Intercom (Paging) and Sound System

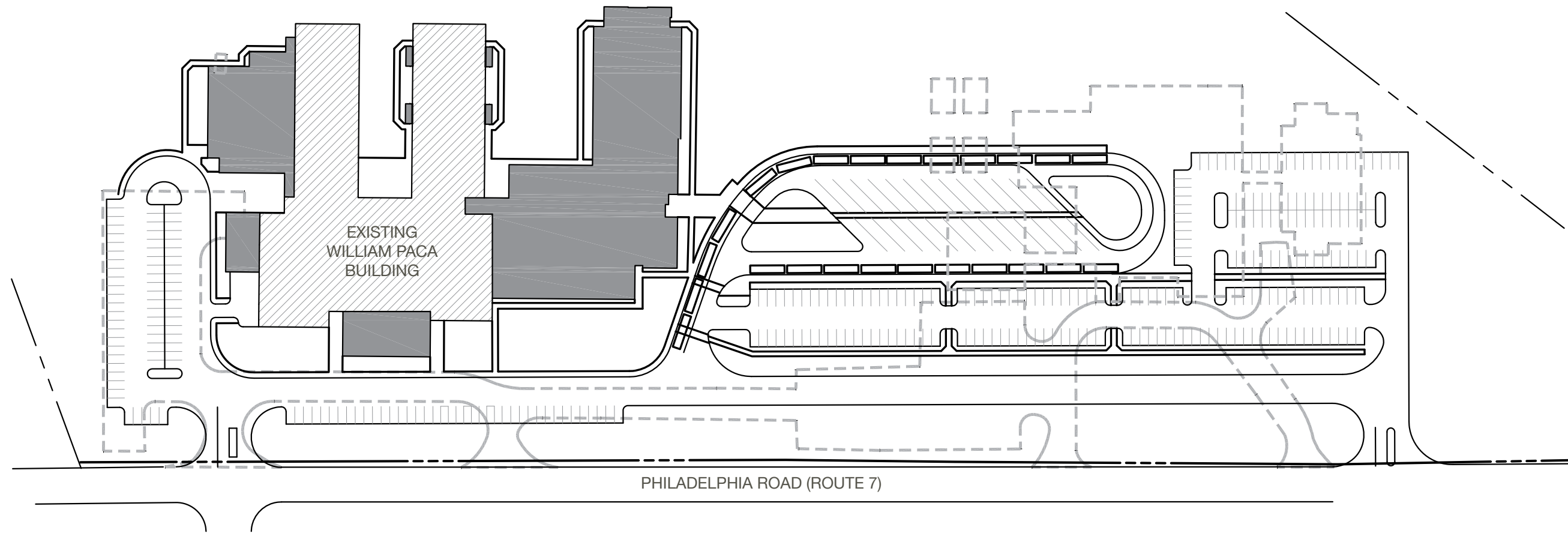
- A new intercom system will be provided throughout the building.
- Provide new sound systems for the cafeteria and gymnasium.
- Provide a new sound system in the auditorium/stage area.

### Voice, Data and Video Systems

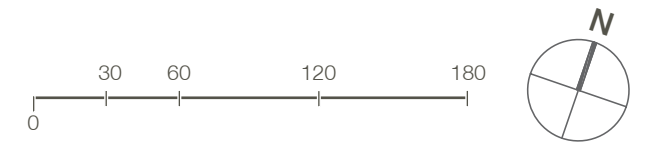
Replace existing voice, data and video systems throughout building.

### Security System

- Provide a new system in all areas of building.
- The final scope of the security system must be developed and defined by the school (i.e. number of cameras, entry devices such as card readers, etc.).



- EXISTING BUILDING
- NEW CONSTRUCTION
- DEMOLITION



Option A + A1 - Modernization

First Floor Plan

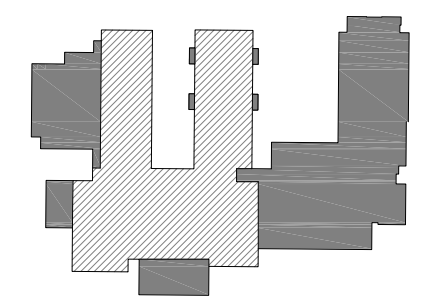
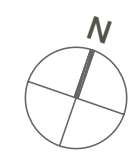


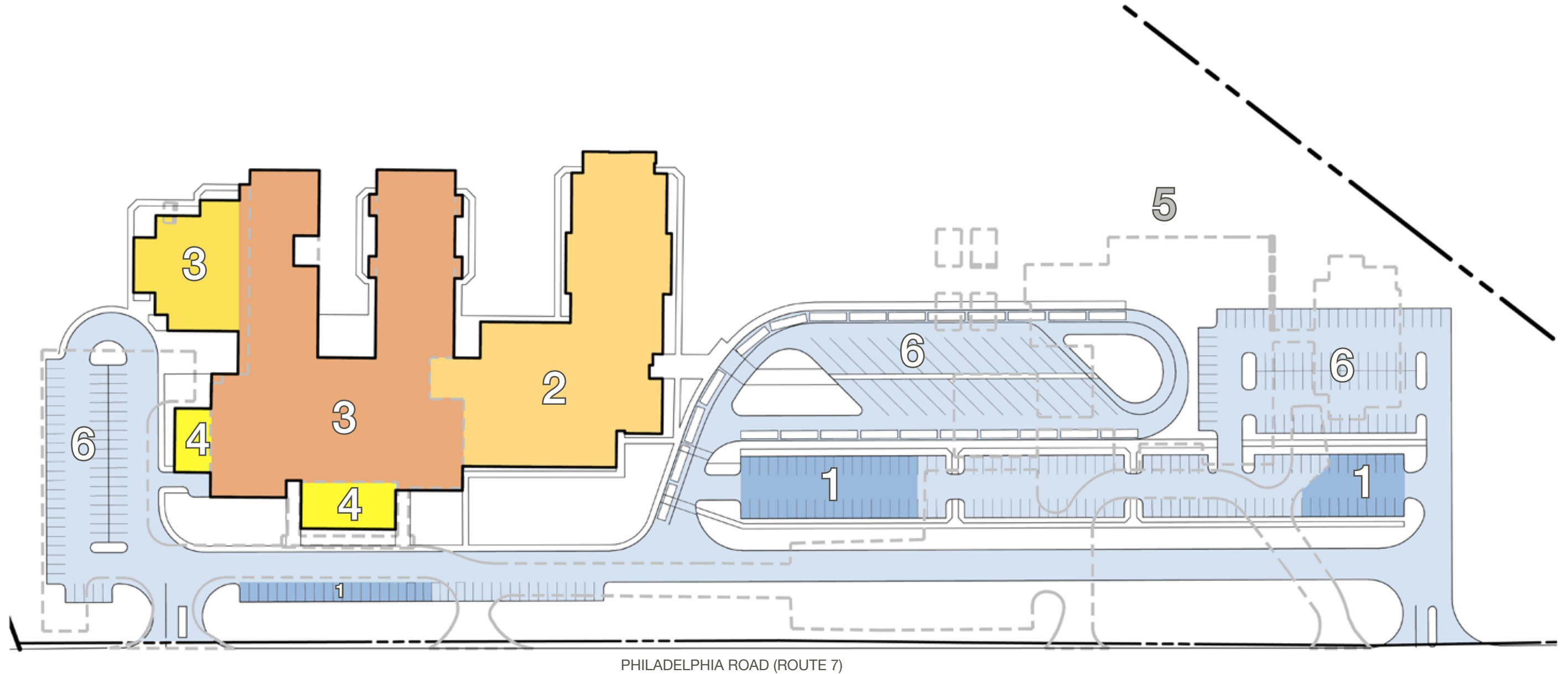
Option A + A1 - Modernization

Second Floor Plan



- ACADEMIC
- ART + MUSIC
- PHYSICAL EDUCATION
- SPECIAL EDUCATION / TITLE ONE
- MEDIA CENTER
- CAFETERIA
- ADMINISTRATION / PLANNING / GUIDANCE
- HEALTH SUITE
- CUSTODIAL SERVICES





• Refer to pages 57-58 for description of phases



## Option A: Modernization Plan



### Assessment

The Modernization option provides educational program and area while reusing the existing structure when feasible.

### Advantages

1. Plan provides student learning areas in daylight areas.
2. Provides for incremental site and building improvements.
3. Provides an aggressive opportunity for construction phasing which will allow for the move out of the Old Post Road complex sooner.
4. Provides opportunities for the plan to provide break out spaces that offer teachers and students “outside” classroom learning spaces.
5. Public access to after hour programs, such as at the media center, gymnasium and play fields.

### Disadvantages

1. Classes will be relocated more often to allow for major construction throughout.
2. Some programs will need to be held in inadequate spaces during construction phasing.
3. Vehicular entrances off Philadelphia Road (Rt. 7) only.
4. Multi-purpose fields will be removed during construction to have access to rear of site.
5. Longest period when construction occurs within the building.
6. Construction is 26 months longer than Replacement Scheme; many activities will need to take place off-site; procurement of furniture and equipment will need to be phased with construction.

## Option A: Modernization Plan

### Anticipated Scope of Work

#### Architectural

- Most interior partitions, doors and frames, ceilings and floors will be new.
- Replace finish of existing floors.
- Replace roof system.
- Re-point masonry exterior walls.
- Replace all exterior door and windows.

#### Existing building to remain:

- Existing floor areas will be reconfigured per plan.
- Existing interior walls and trim are to be repaired, prepared and painted.
- All tile and wall base will be replaced.
- All ceiling tile and metal grid will be replaced.
- Existing roof will be stripped to roof deck and replaced.
- Exterior doors and frames will be replaced.
- All exterior windows will be replaced and supplemented with new openings to meet light and ventilation requirements.
- Interior doors will be replaced with new ADA compliant hardware.
- Classroom and office casework will be redesigned to meet Ed Spec.
- The exterior masonry requires minimum re-pointing.
- Masonry expansion joints will be resealed.
- Replace lockers to meet Ed Spec.
- Existing food service and technology education will be demolished for a new athletic center to meet Ed Spec.

#### Site

- Storm water management to be provided per Maryland Department of the Environment (MDE) and/or Harford County storm water requirements.
- New water and storm drain connections to proposed architecture. Connect to existing off site systems.
- New sidewalks to serve addition and parking.
- Provide and/or relocate play areas.
- New utility services to building as required for gas, electric, telephone and data.
- New parking and bus loop.
- New sidewalks and landscaping.
- Two new site entrances to resolve traffic conflicts.
- New loading area and drive by kitchen.
- Existing grades may require short retaining wall.
- Regrade sports fields.

### Mechanical, Electrical and Plumbing Services

All of the Mechanical, Electrical and Plumbing service responses to the modernization to the William Paca Building are similar responses and are covered in the “Modernization Design Commonalities” section of the report.

### Structural Work

- Minor Repairs as required.
- New foundations and structure for additions.
- Reinforce existing structure for connection to existing. This will be of particular concern where the abutting additions will be higher than the existing roof. Due to the nature of the existing roof construction (7½” metal roof deck spanning 20 to 30 feet), it is not likely to withstand snow drifting loads caused by the higher roof.
- If new roof top units are to be placed on the existing roof, significant additional roof framing will be required to reinforce the existing roof as the existing deep, long-span metal roof deck will not be adequate to support any additional loads.
- Any potential re-roofing at the long-span metal deck will require the existing roof insulation be replaced and not added to, so as to not increase the dead load on the existing metal deck. In addition, the existing metal deck will need to be evaluated after the top surface of the deck is exposed for potential corrosion or damage to the metal deck.

### One-Story Gymnasium Addition

- Load bearing masonry structure.
- The roof structure is anticipated to be long-span open-web steel joists at 5'-0” on-center with 1 ½” 22 gage galvanized metal roof deck.
- A 5” thick slab on grade is anticipated at the first floor contingent upon confirmation from a geotechnical investigation.
- We anticipate a shallow spread foundation system, similar to the existing building. Foundations for the addition will need to be tied-in to the existing classroom wing foundations.
- The existing roof structure of the adjacent classroom wing will need to be evaluated for snow drift loads from the higher gymnasium roof and will likely require structural reinforcement given the nature of the existing roof construction.



## Structural Work (continued)

### Two-Story Classroom Addition

- Steel column and beam system.
- The second floor framing of the classroom wing is anticipated to be structural steel beams and girders with a light-weight concrete slab on composite metal deck.
- The roof structure is anticipated to be open-web steel joists with 1 ½" 22 gage galvanized metal roof deck supported by wide flange steel beams and girders which in turn are supported by steel columns.
- A 5" thick slab on grade is anticipated at the first floor contingent upon confirmation from a geotechnical investigation.
- We anticipate a shallow spread foundation system, similar to the existing building.
- The roof structure of the existing building along the tie-in will need to be evaluated for snow drift loads and will likely require structural reinforcement given the nature of the existing roof construction.

### One-Story Kitchen Addition

- Load bearing masonry structure.
- The roof structure is anticipated to be open-web steel joists at 5'-0" on-center with 1 ½" 22 gage galvanized metal roof deck.
- A 5" thick slab on grade is anticipated at the first floor contingent upon confirmation from a geotechnical investigation.
- We anticipate a shallow spread foundation system, similar to the existing building. Foundations for the addition will need to be tied-in to the existing cafeteria foundations.
- The existing roof structure of the adjacent cafeteria will need to be evaluated for snow drift loads if the roof of the addition is higher than the existing roof, and will likely require structural reinforcement given the nature of the existing roof construction.

### One-Story Administrative Addition

- Load bearing masonry structure.
- The roof structure is anticipated to be open-web steel joists at 5'-0" on-center with 1 ½" 22 gage galvanized metal roof deck.
- A 5" thick slab on grade is anticipated at the first floor contingent upon confirmation from a geotechnical investigation.
- We anticipate a shallow spread foundation system, similar to the existing building. Foundations for the addition will need to be tied-in to the existing administrative area foundations.
- The existing roof structure of the adjacent administrative area will need to be evaluated for snow drift loads if the addition will be higher than the existing, and will likely require structural reinforcement given the nature of the existing roof construction.

### Site Work

- New site entrances to resolve traffic conflicts. Two entrances proposed. One for teachers' parking and parent drop-off, one for bus loop, and one for students and service traffic to kitchen. Entrances comply with Crime Prevention through Environmental Design (CPTED) goals.
- New bus staging loop, 28 spaces.
- Teacher and visitor parking to total 302 spaces, (including existing spaces). Parent Drop-Off area defined from teachers' parking, with nine (9) visitor parking spaces. Parking islands provided for shade trees, creating improved micro-climate around school.
- New loading area and drive to kitchen. Existing grades may require short retaining wall.
- New sidewalks to serve new building and parking. Twelve foot (12') wide walkway from parking.
- New water and storm drain connections to proposed architecture. Connect to existing off site systems.
- New utility services to building as required for gas, electric, telephone and data.
- Moderate grading required for bus loop, parking lots and building.
- Remove lawn areas for building and bus loop. Stabilize all new areas with sod or seed.
- Remove paving in teachers and students lot for new parking configuration.
- Sediment control in existing lawn areas and existing swale. Reconstruct lawn areas and swale to pre-construction condition.
- New native tree and shrub planting to enhance sustainability
- Stormwater management to be provided per MDE and/or Harford County stormwater requirements.



## Phasing Plan

The phasing of Option A will consist of a six (6) phase plan that spans a construction duration of 26 Months this is seen to be a systemic construction plan that will phase the work as it relates to the academic school years but will accommodate continual construction. Below is a detailed description of the phasing plan:

**Phase 1** will consist of two activities. First, sediment & erosion controls must be put in place. Once these controls are in place, a site contractor will come on site and complete the minor parking improvements. Any of the site utilities related to this work should be done at this phase.

**Phase 2** will consist of building the new William Paca Classroom Wing. The plan would be to start this at the same time that the parking lot improvements are being worked on. This work should be started at the beginning of the summer vacation period, due to the necessity to reinforce the existing structure. The work on the new wing will continue while school is in session for the new year and should be completed by the end of the school year.

**Phase 3 and 4** will consist of several parts. First, a trailer complex will be brought in and set up on site to handle the displaced students. The trailer setup should be accomplished during a Winter Break. The new addition of the Gym should be started in the beginning of January, and as work progresses, the trailers will be used for Gym Activities when renovation work and tie-in work begins. As the gym is being completed, one of the existing classroom wings will begin the renovation period. Students from this disturbed classroom wing will then move into the trailers. And finally, the second classroom renovation wing will start after the first wing is completed. This is expected to happen during the summer months, so that the students won't be disrupted by this change. At this time, when the students return to the school, they will be able to occupy the northern portion of the school as well as the new classroom wing.

At the end of the summer period, work will begin on the Café and Administration areas. The trailers will then be used for the Administration and Learning Resource Centers as the minor additions and renovations continue throughout the southern portion of the school. It is anticipated that this work will be completed and ready for occupancy at the end of the spring break.

**Phase 5** will consist of the demolition of the Old Post School. The trailer complex will be removed.

**Phase 6** will consist of finalizing all site work related to this job. The idea is to work this in conjunction with Phase 5, working from the west to the east, so that as the building is demolished, the parking will be able to be completed.

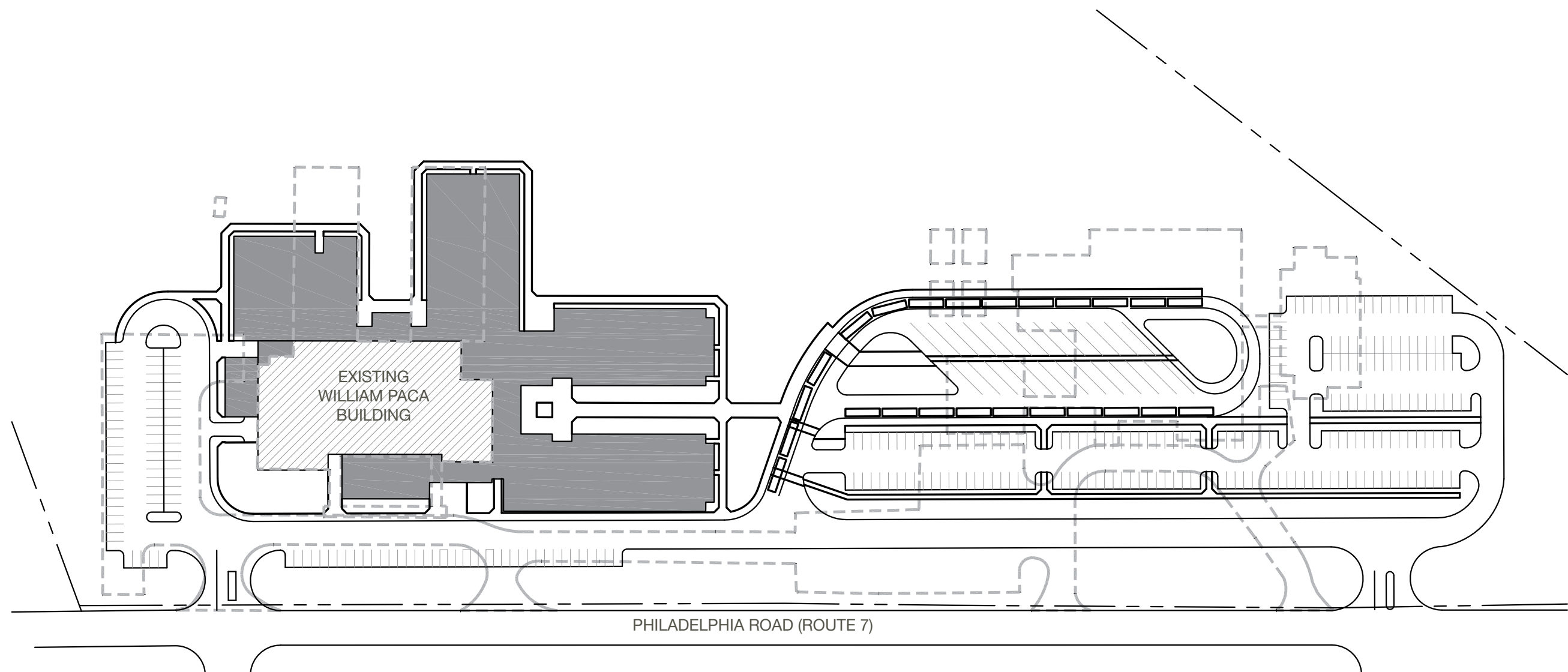
## Alternative Phasing Plan

### Option A1 - Modernization

The phasing of Option A1 will consist of a multi-phased phased plan that has no set construction duration. The Option A1 is designed to be approached as a “kit of parts” concept. This “kit of parts” concept offers the construction scope of the Option A - Modernization plan, but over a longer period as funding becomes available. The detailed description of the phases will follow the above narrative in Option A - Modernization, but have a different construction duration.

Construction duration will be dependant upon the phasing options pursued. Below is a detailed break out of the options and the construction duration of each option:

<u>Phased Options</u>	<u>Construction Duration</u>
HVAC Modifications, including Gable Roof	14 Months
Building Envelope	03 Months
Early Site Parking Modifications	04 Weeks
New Classroom Wing	12 Months
Additional/Renovation Work at Existing School	16 Months
Demolition of Old Post Building	02 Months



PHILADELPHIA ROAD (ROUTE 7)

- EXISTING BUILDING
- NEW CONSTRUCTION
- DEMOLITION



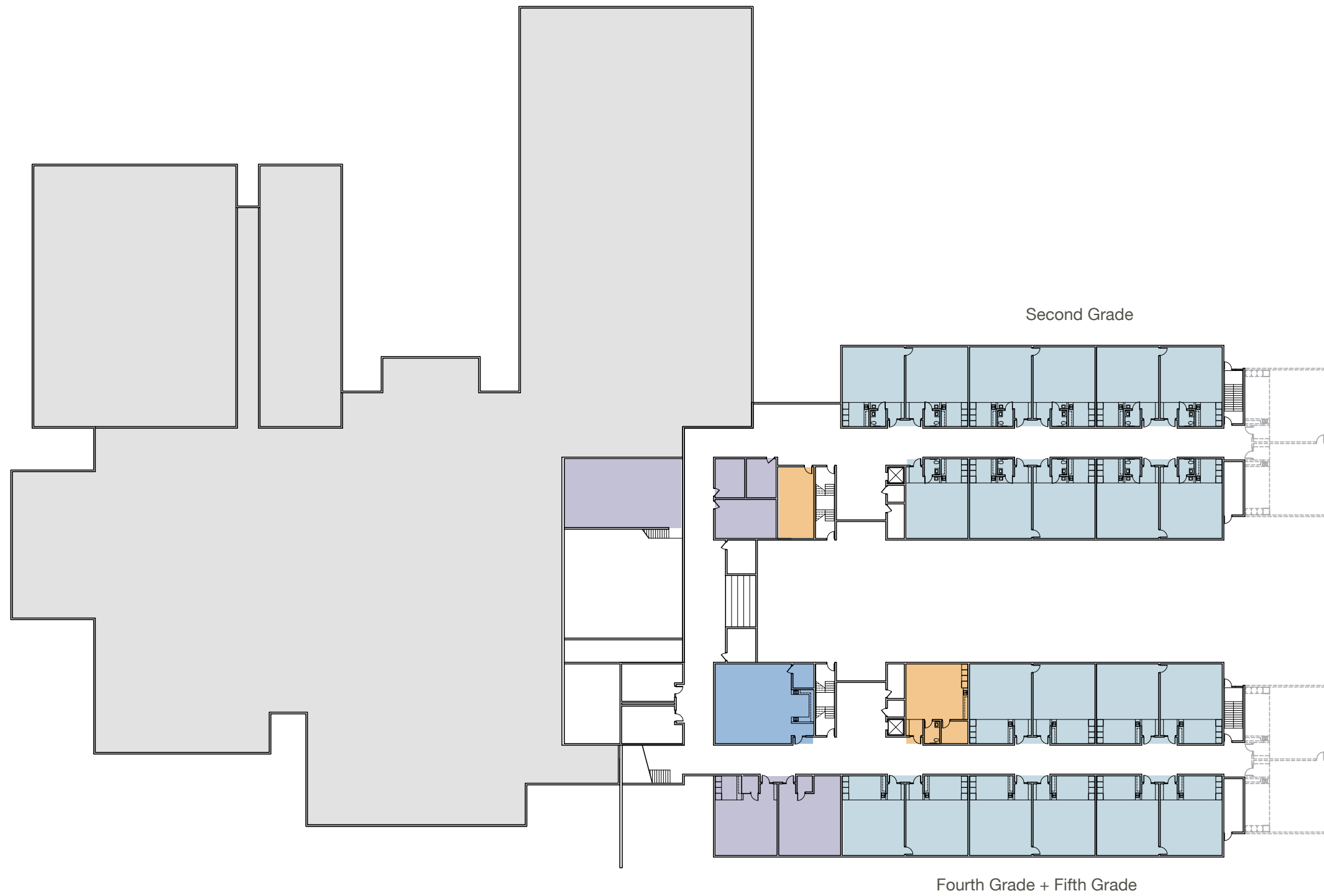
Option B - Modernization

First Floor Plan

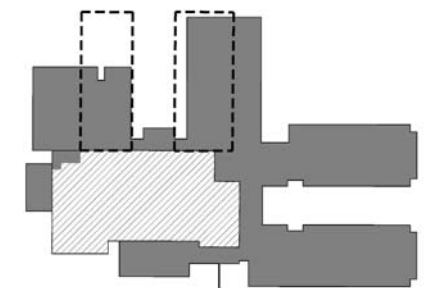


Option B - Modernization

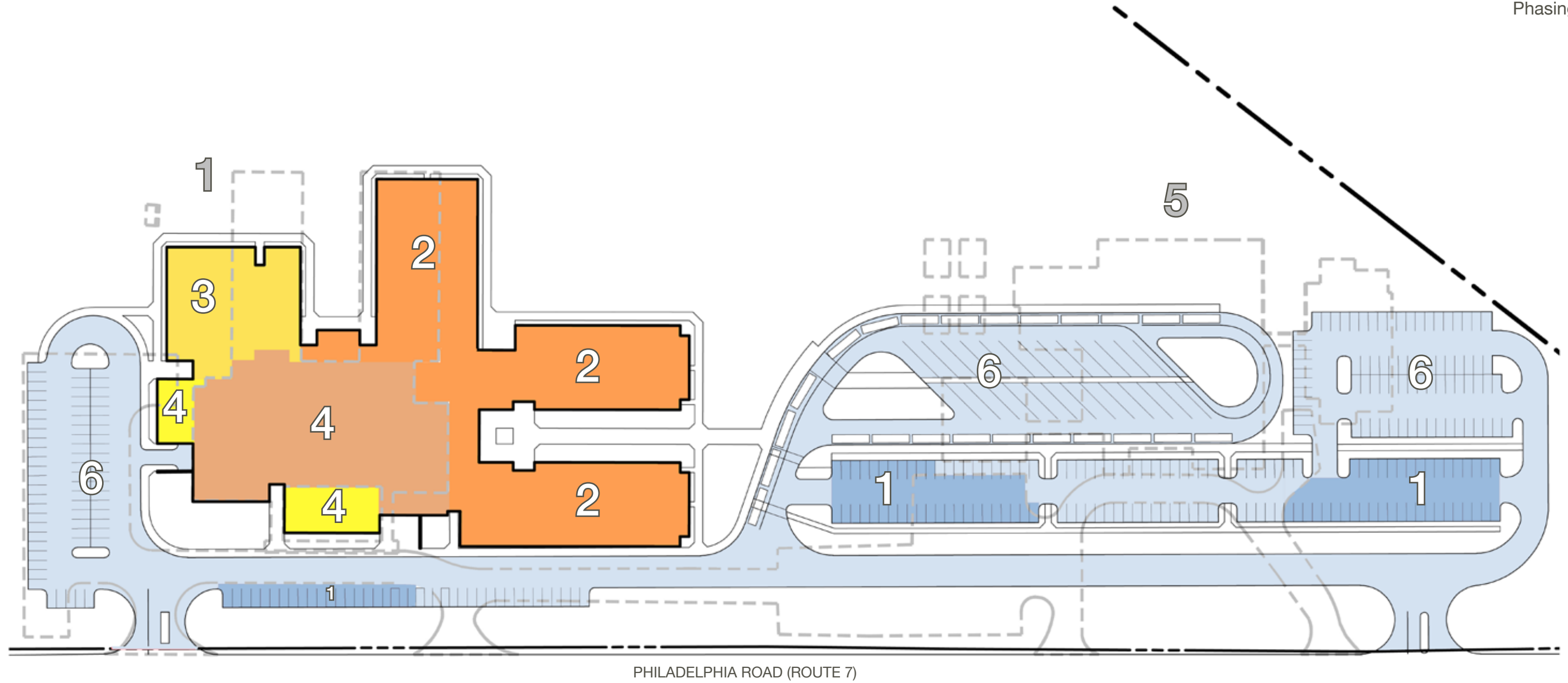
Second Floor Plan



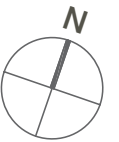
- ACADEMIC
- ART + MUSIC
- PHYSICAL EDUCATION
- SPECIAL EDUCATION / TITLE ONE
- MEDIA CENTER
- CAFETERIA
- ADMINISTRATION / PLANNING / GUIDANCE
- HEALTH SUITE
- CUSTODIAL SERVICES







• Refer to page 69 for description of phases



## Option B: Modernization Plan



### Assessment

The Modernization option provides educational program and area while reusing the existing structure when feasible.

### Advantages:

1. Plan provides comfortable student learning areas in daylight areas.
2. The entry control of gym is at one location to provide ease of control after hours during “after-school” events.
3. Provides for a phased construction implementation of the program and allows the county construction of programs as the budget allows

### Disadvantages:

1. Classes will be relocated more often to allow for major construction throughout.
2. Some programs will need to be held in inadequate spaces during construction phasing.
3. Vehicular entrances off Philadelphia Road (Rt. 7) only.
4. Multi-purpose fields will be removed during construction to have access to rear of site.
5. Longest period when construction occurs within the building.
6. Larger amount of demolition in Option B than in Option A which could impact the phasing and duration of construction.
7. Construction is 26 months longer than Replacement Scheme; many activities will need to take place off-site; procurement of furniture and equipment will need to be phased with construction.

## Option B: Modernization Plan

### Anticipated Scope of Work

#### Architectural

- Most interior partitions, doors and frames, ceilings and floors will be new.
- Replace finish of existing floors.
- Replace roof system.
- Re-point masonry exterior walls.
- Replace all exterior door and windows.

#### Existing building to remain:

- Existing floor areas will be reconfigured per plan.
- Existing interior walls and trim are to be repaired, prepared and painted.
- All tile and wall base will be replaced.
- All ceiling tile and metal grid will be replaced.
- Existing roof will be stripped to roof deck and replaced.
- Exterior doors and frames will be replaced.
- All exterior windows will be replaced and supplemented with new openings to meet light and ventilation requirements.
- Interior doors will be replaced with new ADA compliant hardware.
- Classroom and office casework will be redesigned to meet Ed Spec.
- The exterior masonry requires minimum re-pointing.
- Masonry expansion joints will be resealed.
- Replace lockers to meet Ed Spec.
- Existing food service and technology education will be demolished for a new athletic center to meet Ed Spec.

#### Site

- Storm water management to be provided per Maryland Department of the Environment (MDE) and/or Harford County storm water requirements.
- New water and storm drain connections to proposed architecture. Connect to existing off site systems.
- New sidewalks to serve addition and parking.
- Provide and/or relocate play areas.
- New utility services to building as required for gas, electric, telephone and data.
- New parking and bus loop.
- New sidewalks and landscaping.
- Two new site entrances to resolve traffic conflicts.
- New loading area and drive by kitchen.
- Existing grades may require short retaining wall.
- Regrade sports fields.

## Mechanical, Electrical and Plumbing Services

All of the Mechanical, Electrical and Plumbing service responses to the modernization to the William Paca Building are similar responses and are covered in the “Modernization Design Commonalities” section of the report.

## Structural Work

- Minor Repairs as required.
- New foundations and structure for additions.
- Reinforce existing structure for connection to existing. This will be of particular concern where the abutting additions will be higher than the existing roof. Due to the nature of the existing roof construction (7½” metal roof deck spanning 20 to 30 feet), it is not likely to withstand snow drifting loads caused by the higher roof.
- If new roof top units are to be placed on the existing roof, significant additional roof framing will be required to reinforce the existing roof as the existing deep, long-span metal roof deck will not be adequate to support any additional loads.
- Any potential re-roofing at the long-span metal deck will require the existing roof insulation be replaced and not added to, so as to not increase the dead load on the existing metal deck. In addition, the existing metal deck will need to be evaluated after the top surface of the deck is exposed for potential corrosion or damage to the metal deck.

## One-Story Gymnasium Addition

- Load bearing masonry structure.
- The roof structure is anticipated to be long-span open-web steel joists at 5’-0” on-center with 1 ½” 22 gage galvanized metal roof deck.
- A 5” thick slab on grade is anticipated at the first floor contingent upon confirmation from a geotechnical investigation.
- We anticipate a shallow spread foundation system, similar to the existing building. Foundations for the addition will need to be tied-in to the existing classroom wing foundations.
- The existing roof structure of the adjacent classroom wing will need to be evaluated for snow drift loads from the higher gymnasium roof and will likely require structural reinforcement given the nature of the existing roof construction.

## Two-Story Classroom Addition

- Steel column and beam system.
- The second floor framing of the classroom wing is anticipated to be structural steel beams and girders with a light-weight concrete slab on composite metal deck.
- The roof structure is anticipated to be open-web steel joists with 1 ½" 22 gage galvanized metal roof deck supported by wide flange steel beams and girders which in turn are supported by steel columns.
- A 5" thick slab on grade is anticipated at the first floor contingent upon confirmation from a geotechnical investigation.
- We anticipate a shallow spread foundation system, similar to the existing building.
- The roof structure of the existing building along the tie-in will need to be evaluated for snow drift loads and will likely require structural reinforcement given the nature of the existing roof construction.

## One-Story Kitchen Addition

- Load bearing masonry structure.
- The roof structure is anticipated to be open-web steel joists at 5'-0" on-center with 1 ½" 22 gage galvanized metal roof deck.
- A 5" thick slab on grade is anticipated at the first floor contingent upon confirmation from a geotechnical investigation.
- We anticipate a shallow spread foundation system, similar to the existing building. Foundations for the addition will need to be tied-in to the existing cafeteria foundations.
- The existing roof structure of the adjacent cafeteria will need to be evaluated for snow drift loads if the roof of the addition is higher than the existing roof, and will likely require structural reinforcement given the nature of the existing roof construction.

## One-Story Administrative Addition

- Load bearing masonry structure.
- The roof structure is anticipated to be open-web steel joists at 5'-0" on-center with 1 ½" 22 gage galvanized metal roof deck.
- A 5" thick slab on grade is anticipated at the first floor contingent upon confirmation from a geotechnical investigation.
- We anticipate a shallow spread foundation system, similar to the existing building. Foundations for the addition will need to be tied-in to the existing administrative area foundations.
- The existing roof structure of the adjacent administrative area will need to be evaluated for snow drift loads if the addition will be higher than the existing, and will likely require structural reinforcement given the nature of the existing roof construction.

### Site Work

- New site entrances to resolve traffic conflicts. Two entrances proposed. One for teachers' parking and parent drop-off, one for bus loop, and one for students and service traffic to kitchen. Entrances comply with Crime Prevention through Environmental Design (CPTED) goals.
- New bus staging loop, 28 spaces.
- Teacher and visitor parking to total 302 spaces, (including existing spaces). Parent Drop-Off area defined from teachers' parking, with nine (9) visitor parking spaces. Parking islands provided for shade trees, creating improved micro-climate around school.
- New loading area and drive to kitchen. Existing grades may require short retaining wall.
- New sidewalks to serve new building and parking. Twelve foot (12') wide walkway from parking.
- New water and storm drain connections to proposed architecture. Connect to existing off site systems.
- New utility services to building as required for gas, electric, telephone and data.
- Moderate grading required for bus loop, parking lots and building.
- Remove lawn areas for building and bus loop. Stabilize all new areas with sod or seed.
- Remove paving in teachers and students lot for new parking configuration.
- Sediment control in existing lawn areas and existing swale. Reconstruct lawn areas and swale to pre-construction condition.
- New native tree and shrub planting to enhance sustainability
- Stormwater management to be provided per MDE and/or Harford County stormwater requirements.



## Phasing Plan

The phasing of Option B will consist of a six (6) phase plan that spans a construction duration of 26 Months this is seen to be a systemic construction plan that will phase the work as it relates to the academic school years but will accommodate continual construction. Below is a detailed description of the phasing plan:

**Phase 1** will consist of two activities. First, sediment & erosion controls must be put in place. Once these controls are in place, a site contractor will come on site and complete the minor parking improvements. Any of the site utilities related to this work should be done at this phase. Relocation of student body from the William Paca building to re-locatable classrooms will be performed in this phase for the demolition of the undersized academic wings.

**Phase 2** will consist of building the new William Paca Classroom Wings. The plan would be to start this at the same time that the parking lot improvements are being worked on. This work should be start at the beginning of the summer vacation period, due to the necessity to reinforce the existing structure. The work on the new wings will continue while school is in session for the new year and should be completed by the end of the school year.

**Phase 3 and 4** will consist of several parts. First, a trailer complex will be brought in and set up on site to handle the displaced students. The trailer setup should be accomplished during a Winter Break. The new addition of the Gym should be started in the beginning of January, and as work progresses, the trailers will be used for Gym Activities when renovation work and tie-in work begins. As the gym is being completed, one of the existing classroom wings will begin the renovation period. Students from this disturbed classroom wing will then move into the trailers. And finally, the second classroom renovation wing will start after the first wing is completed. This is expected to happen during the summer months, so that the students won't be disrupted by this change. At this time, when the students return to the school, they will be able to occupy the northern portion of the school as well as the new classroom wing.

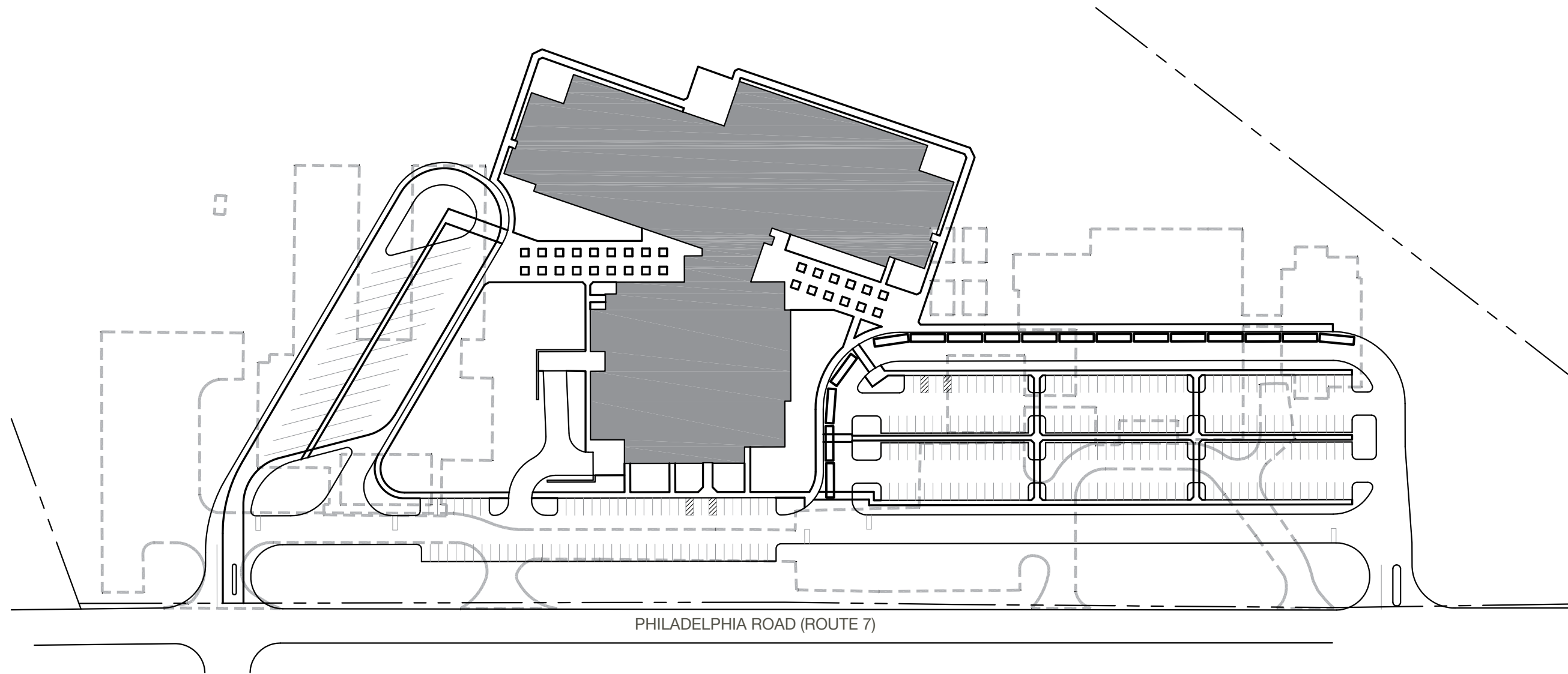
At the end of the summer period, work will begin on the Café and Administration areas. The trailers will then be used for the Administration and Learning Resource Centers as the minor additions and renovations continue throughout the southern portion of the school. It is anticipated that this work will be completed and ready for occupancy at the end of the spring break.

**Phase 5** will consist of the demolition of the Old Post School. The trailer complex will be removed.

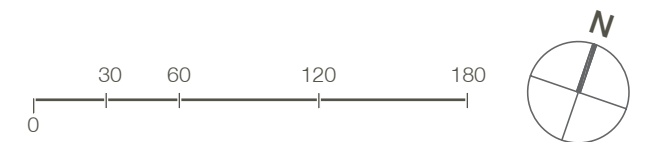
**Phase 6** will consist of finalizing all site work related to this job. The idea is to work this in conjunction with Phase 5, working from the west to the east, so that as the building is demolished, the parking will be able to be completed.







- EXISTING BUILDING
- NEW CONSTRUCTION
- DEMOLITION

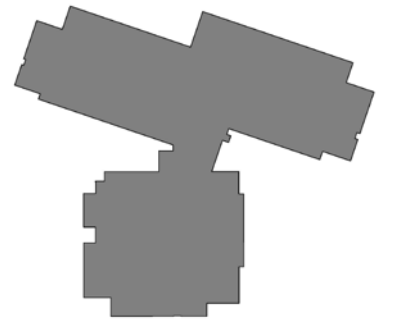
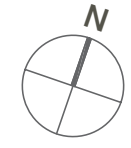


Option C - Replacement

First Floor Plan



- ACADEMIC
- ART + MUSIC
- PHYSICAL EDUCATION
- SPECIAL EDUCATION / TITLE ONE
- MEDIA CENTER
- CAFETERIA
- ADMINISTRATION / PLANNING / GUIDANCE
- HEALTH SUITE
- CUSTODIAL SERVICES

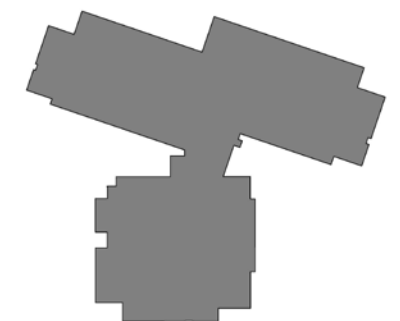


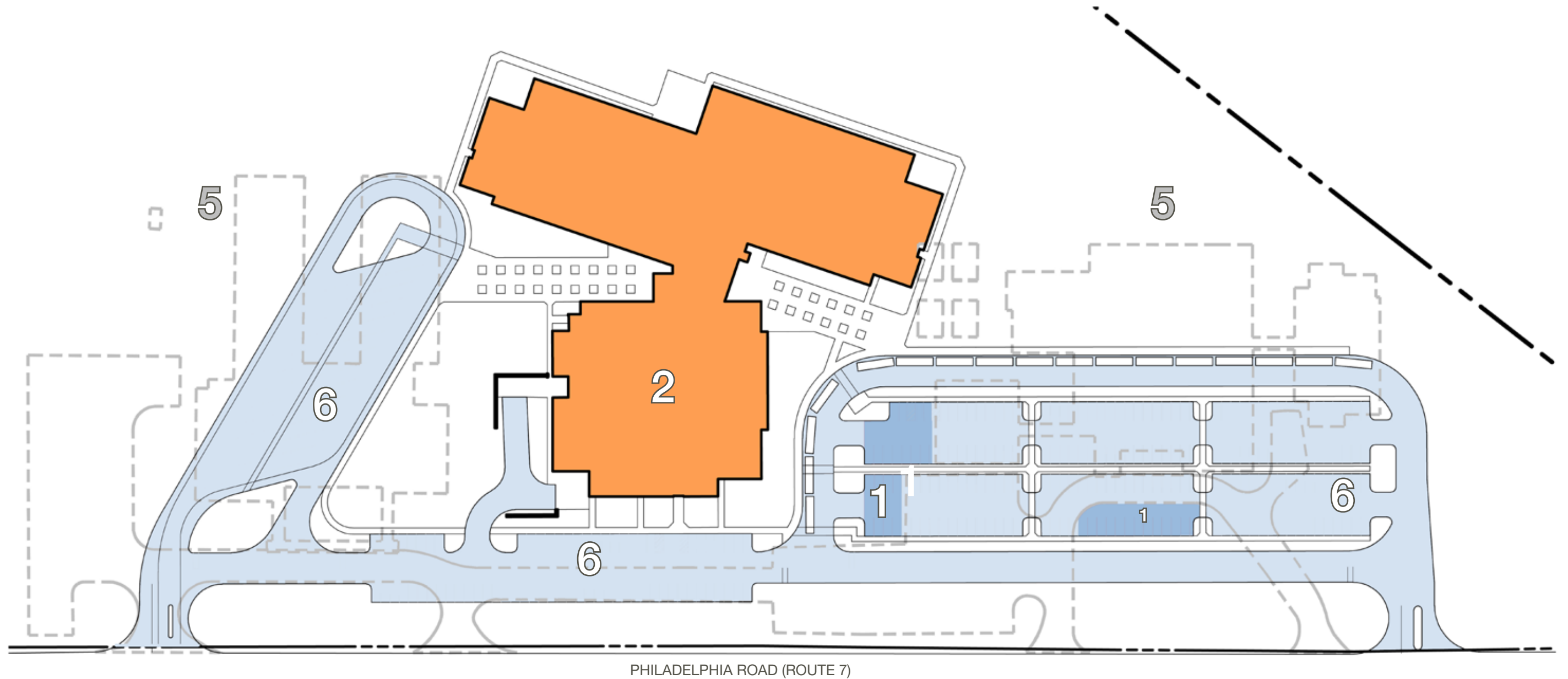
Option C - Replacement

Second Floor Plan



- ACADEMIC
- ART + MUSIC
- PHYSICAL EDUCATION
- SPECIAL EDUCATION / TITLE ONE
- MEDIA CENTER
- CAFETERIA
- ADMINISTRATION / PLANNING / GUIDANCE
- HEALTH SUITE
- CUSTODIAL SERVICES

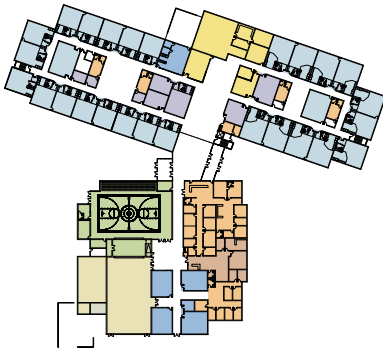




• Refer to page 77 for description of phases



### Option C: Modernization Plan



#### Assessment

A new building will be constructed on site while the existing building is in use.

#### Advantages:

1. The new compact facility will meet Ed Spec requirements. This includes life safety, Americans with Disabilities Act (ADA), technology, room sizes and energy efficiency.
2. Reduced construction schedule 22 months.
3. Can be constructed without disrupting school.
4. Direct daylighting is provided into all classrooms.
5. Increases the seating in the gymnasium.
6. Improves parking and bus/parent drop-off circulation.
7. There will be no phasing in the building; students and teachers make one move into the new building; the new building will be ready sooner than the Modernization.

#### Disadvantages:

1. Vehicular entrances off Philadelphia Road only.
2. Site Circulation will be further disrupted through the duration of construction.
3. All play fields will be unavailable for through the duration of construction.
4. There will be no fields available on-site during construction.
5. Highest initial life cycle cost as compared to Options A and B.



## Phasing Plan

The phasing of Option C will consist of a four (4) phase plan that spans a construction duration of 22 Months this is seen to be a systemic construction plan that will phase the work as it relates to the academic school years but will accommodate continual construction. Following the outline of the modernization phasing plan, below is a detailed description of the phasing plan:

**Phase 1** will consist of two activities. First, sediment & erosion controls must be put in place. Once these controls are in place, a site contractor will come on site and complete the minor parking improvements. Any of the site utilities related to this work should be done at this phase.

**Phase 2** will consist of building the new School between the two existing schools. The existing trailers will need to be relocated as well as an existing playground. It is anticipated that this will start at nearly the same time as Phase 1 to expedite that process.

**Phase 3** is not used.

**Phase 4** is not used.

**Phase 5** will consist of demolishing both existing schools.

**Phase 6** will consist of the finalization of the site work, including new parking, and site utilities. As Phase 6 is in progress, temporary parking arrangements will need to be made with either use on site or phasing requirements for the parking. The parking lot improvements can not be completed until Phase 5 is finished due to much of the existing building footprints being within the confines of the new parking layout.







- Appendix A Study Team
- Appendix B Project Schedule
- Appendix C Programs
- Appendix D Sustainable Design
- Appendix E Building Security & Site Safety



Appendix A - Cost Estimates

**William Paca Elementary School**

CSI 16 Division Summary  
Schematic Estimates

15-May-09

Modernization A:	148,351	Total Modernization A: \$	41,702,657
Modernization B:	145,401	Total Modernization B: \$	41,960,372
Replacement:	145,447	Total Replacement: \$	37,940,832

Division	Category / Division	Modernization A	Modernization A SF	Modernization B	Modernization B SF	Replacement	Replacement
1	General Conditions	2,640,783	17.80	2,653,902	18.25	1,565,778	10.77
2	Site Work & Demolition	5,293,373	35.68	5,333,426	36.68	5,411,281	37.20
3	Concrete	1,557,983	10.50	1,624,346	11.17	1,484,889	10.21
4	Masonry	3,574,275	24.09	3,726,521	25.63	3,406,585	23.42
5	Metals	1,685,022	11.36	1,756,796	12.08	1,605,968	11.04
6	Woods / Plastics	311,177	2.10	324,432	2.23	296,578	2.04
7	Thermal / Moisture	2,872,303	19.36	2,097,817	14.43	1,917,712	13.18
8	Doors / Windows	1,238,633	8.35	1,291,392	8.88	1,180,521	8.12
9	Finishes	1,359,346	9.16	1,417,248	9.75	1,295,571	8.91
10	Specialties	318,911	2.15	332,495	2.29	303,949	2.09
11	Equipment	458,809	3.09	478,352	3.29	437,283	3.01
12	Furnishings	919,578	6.20	958,747	6.59	876,435	6.03
13	Special Construction	674,263	4.55	702,983	4.83	642,629	4.42
14	Conveying Systems	-	-	-	-	-	-
15	HVAC / Plumbing	6,368,175	42.93	6,639,428	45.66	6,069,407	41.73
16	Electrical	3,175,749	21.41	3,311,020	22.77	3,026,756	20.81
	<b>Sub-Total</b>	<b>\$ 32,448,379</b>	<b>218.73</b>	<b>\$ 32,648,905</b>	<b>224.54</b>	<b>\$ 29,521,344</b>	<b>202.97</b>
	<b>Schematic Estimate Contingency -- 20%</b>	<b>6,489,676</b>	<b>43.75</b>	<b>6,529,781</b>	<b>44.91</b>	<b>5,904,269</b>	<b>40.59</b>
	<b>Payment &amp; Performance Bond -- 2%</b>	<b>778,761</b>	<b>5.25</b>	<b>783,574</b>	<b>5.39</b>	<b>708,512</b>	<b>4.87</b>
	<b>Overhead &amp; Profit -- 5%</b>	<b>1,985,841</b>	<b>13.39</b>	<b>1,998,113</b>	<b>13.74</b>	<b>1,806,706</b>	<b>12.43</b>
	<b>Total CD Estimate</b>	<b>\$ 41,702,657</b>	<b>281.11</b>	<b>\$ 41,960,372</b>	<b>288.58</b>	<b>\$ 37,940,832</b>	<b>260.86</b>

Modernization A-1 Breakout	Cost	Duration
A: 4-Pipe HVAC Modifications, including Gable Roof:	\$ 7,759,352	14 Months
A1: Geo Thermal HVAC Upgrade, including Gable Roof:	\$ 8,869,797	14 Months
B: Building Envelope (Brick Veneer and Windows):	\$ 1,779,118	3 Months
C: Early Site Parking Modifications:	\$ 176,289	4 Weeks
D: Addition/Renovation Work at Existing School:	\$ 12,479,782	16 Months
E: New Classroom Wing:	\$ 22,401,009	12 Months
F: Demolition of Old Post Building	\$ 719,039	2 Months
<b>Total Modernization A1 Breakout:</b>	<b>\$ 46,425,035</b>	

**Notes:**

- 1) Based on Schematic Estimates dated April 20, 2009 and conversations with the Architect.
- 2) 20% Estimate Contingency included for Estimate Phase. This is not a Project Contingency.
- 3) Allowance allocated for Hazmat Removal.



## Appendix A - Cost Estimates

## Option A + A1 - Modernization

Division	Category / Division	Modernization A	Modernization A SF
1	General Conditions	2,640,783	17.80
2	Site Work & Demolition	5,293,373	35.68
3	Concrete	1,557,983	10.50
4	Masonry	3,574,275	24.09
5	Metals	1,685,022	11.36
6	Woods / Plastics	311,177	2.10
7	Thermal / Moisture	2,872,303	19.36
8	Doors / Windows	1,238,633	8.35
9	Finishes	1,359,346	9.16
10	Specialties	318,911	2.15
11	Equipment	458,809	3.09
12	Furnishings	919,578	6.20
13	Special Construction	674,263	4.55
14	Conveying Systems	-	-
15	HVAC / Plumbing	6,368,175	42.93
16	Electrical	3,175,749	21.41
<b>Sub-Total</b>		<b>\$ 32,448,379</b>	<b>218.73</b>
<b>Schematic Estimate Contingency -- 20%</b>		<b>6,489,676</b>	<b>43.75</b>
<b>Payment &amp; Performance Bond -- 2%</b>		<b>778,761</b>	<b>5.25</b>
<b>Overhead &amp; Profit -- 5%</b>		<b>1,985,841</b>	<b>13.39</b>
<b>Total CD Estimate</b>		<b>\$ 41,702,657</b>	<b>281.11</b>

<b>Modernization A-1 Breakout</b>		<b>Cost</b>	<b>Duration</b>
<b>A:</b>	4-Pipe HVAC Modifications, including Gable Roof:	<b>\$ 7,759,352</b>	<b>14 Months</b>
<b>B:</b>	Building Envelope (Brick Veneer and Windows):	<b>\$ 1,779,118</b>	<b>3 Months</b>
<b>C:</b>	Early Site Parking Modifications:	<b>\$ 176,289</b>	<b>4 Weeks</b>
<b>D:</b>	Addition/Renovation Work at Existing School:	<b>\$ 12,479,782</b>	<b>16 Months</b>
<b>E:</b>	New Classroom Wing:	<b>\$ 22,401,009</b>	<b>12 Months</b>
<b>F:</b>	Demolition of Old Post Building	<b>\$ 719,039</b>	<b>2 Months</b>
<b>Total Modernization A1 Breakout:</b>		<b>\$ 45,314,589</b>	

## Appendix A - Cost Estimates

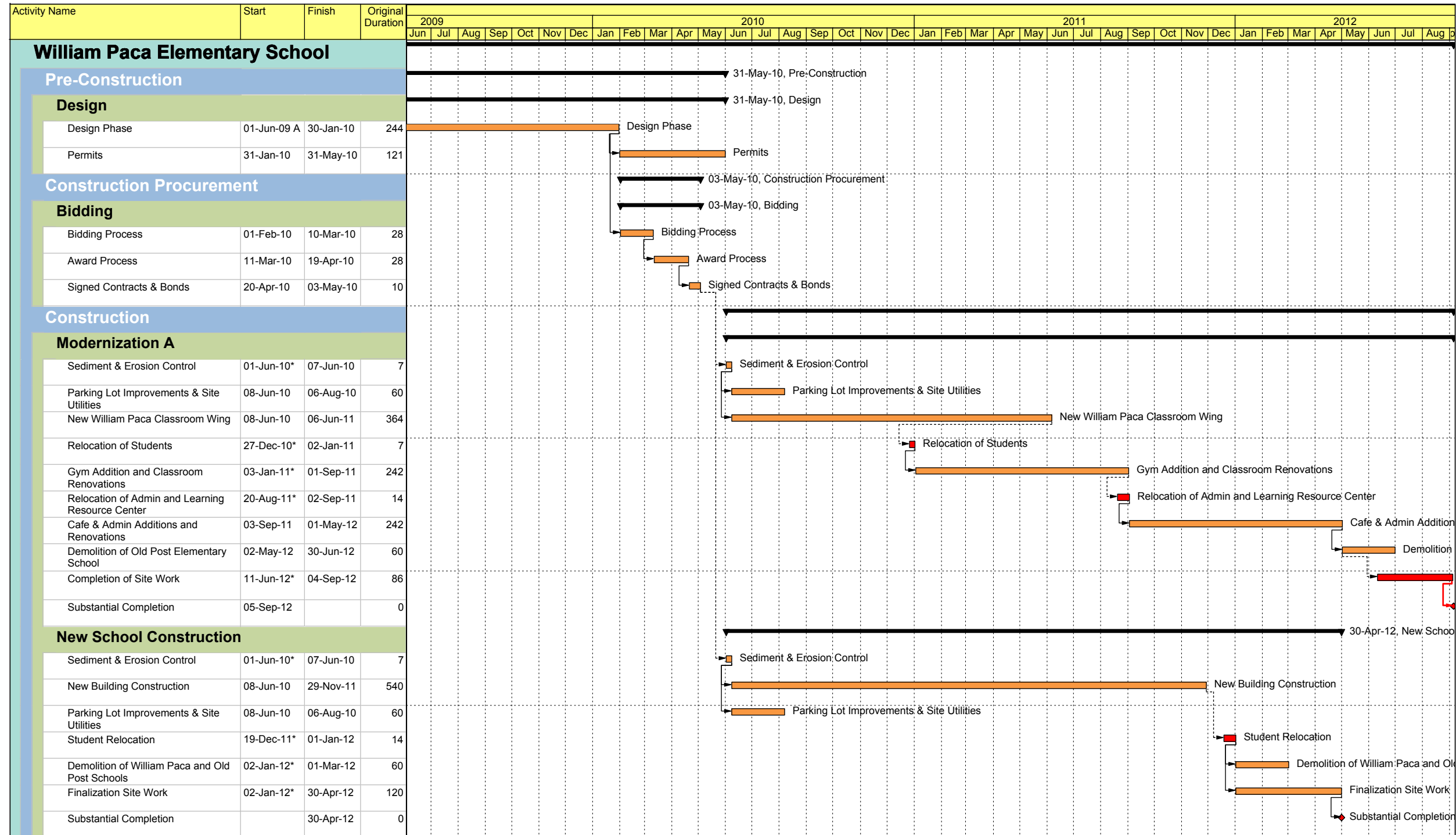
## Option B - Modernization



Division	Category / Division	Modernization B	Modernization B SF
1	General Conditions	2,653,902	18.25
2	Site Work & Demolition	5,333,426	36.68
3	Concrete	1,624,346	11.17
4	Masonry	3,726,521	25.63
5	Metals	1,756,796	12.08
6	Woods / Plastics	324,432	2.23
7	Thermal / Moisture	2,097,817	14.43
8	Doors / Windows	1,291,392	8.88
9	Finishes	1,417,248	9.75
10	Specialties	332,495	2.29
11	Equipment	478,352	3.29
12	Furnishings	958,747	6.59
13	Special Construction	702,983	4.83
14	Conveying Systems	-	-
15	HVAC / Plumbing	6,639,428	45.66
16	Electrical	3,311,020	22.77
<b>Sub-Total</b>		<b>\$ 32,648,905</b>	<b>224.54</b>
<b>Schematic Estimate Contingency -- 20%</b>		<b>6,529,781</b>	<b>44.91</b>
<b>Payment &amp; Performance Bond -- 2%</b>		<b>783,574</b>	<b>5.39</b>
<b>Overhead &amp; Profit -- 5%</b>		<b>1,998,113</b>	<b>13.74</b>
<b>Total CD Estimate</b>		<b>\$ 41,960,372</b>	<b>288.58</b>

Appendix A - Cost Estimates

Option C - Replacement

Division	Category / Division	Replacement	Replacement
1	General Conditions	1,565,778	10.77
2	Site Work & Demolition	5,411,281	37.20
3	Concrete	1,484,889	10.21
4	Masonry	3,406,585	23.42
5	Metals	1,605,968	11.04
6	Woods / Plastics	296,578	2.04
7	Thermal / Moisture	1,917,712	13.18
8	Doors / Windows	1,180,521	8.12
9	Finishes	1,295,571	8.91
10	Specialties	303,949	2.09
11	Equipment	437,283	3.01
12	Furnishings	876,435	6.03
13	Special Construction	642,629	4.42
14	Conveying Systems	-	-
15	HVAC / Plumbing	6,069,407	41.73
16	Electrical	3,026,756	20.81
<b>Sub-Total</b>		<b>\$ 29,521,344</b>	<b>202.97</b>
<b>Schematic Estimate Contingency -- 20%</b>		<b>5,904,269</b>	<b>40.59</b>
<b>Payment &amp; Performance Bond -- 2%</b>		<b>708,512</b>	<b>4.87</b>
<b>Overhead &amp; Profit -- 5%</b>		<b>1,806,706</b>	<b>12.43</b>
<b>Total CD Estimate</b>		<b>\$ 37,940,832</b>	<b>260.86</b>



<ul style="list-style-type: none"> <li> Remaining Level of Effort</li> <li> Actual Work</li> <li> Remaining Work</li> <li> Critical Remaining Work</li> <li> Milestone</li> <li> Summary</li> </ul>	<p><b>William Paca / Old Post Road Elementary School</b></p> <p>Data Date 01-Jun-09</p> <p>Preliminary Schedule</p>		 <p><b>SCHAFFER &amp; SONS, INC.</b> CONSTRUCTION MANAGERS</p>
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1063 Student Capacity (medium)

Activity/Program	Proposed WP/OPR Elementary School Program - 1063 Students					
	State Classroom Capacity	# Teaching Spaces	# Rooms	Total # of Students	Ed. Spec. Size (ea.)	Total
<b>PRIMARY BUILDING</b>						
<b>Academic (Classrooms, etc)</b>			98			
Pre-Kindergarten w/ Toilets (Full Day)	20	2	2	40	1000	2000
Pre-Kindergarten w/ Toilets (Half day)	20	1	1	40	1000	1000
Kindergarten (full day) w/ Toilets	22	8	8	176	1100	8800
Grade 1 Classrooms w/ Toilets	23	7	7	161	850	5950
Grade 2 Classrooms w/ Toilets	23	7	7	161	850	5950
Grade 3 Classrooms	23	7	7	161	800	5600
Grade 4 Classrooms	23	7	7	161	800	5600
Grade 5 Classrooms	23	7	7	161	800	5600
Flexible Classrooms (One w/ Toilet)	22	1	1	22	850	850
Flexible Classrooms	23	2	2	46	800	1600
<b>Total # of Classrooms/ Students</b>			49	1063		
<b>Art</b>			5			
Art Room			2		900	1800
Kiln Room/Area			1		60	60
Storage Workroom			2		100	200
<b>Music</b>			5			
Music Room			3		800	2400
Instrumental Music			1		1000	1000
Equipment Storage			1		240	240
<b>Physical Education</b>			7			
Gymnasium/Multi Purpose			1		6000	6000
Office (Shared by 2 instructors)			1		150	150
Staff Toilet			1		60	60
Storage			1		300	300
Storage (Parks & Rec)			1		150	150
Chair and Table Storage			1		200	200
Stage			1		950	950
<b>Specialist's Area</b>			5			
Enrichment			1		600	600
Math			1		600	600
Reading Room			2		750	1500
Book Storage			1		200	200
						0

Existing Conditions - William Paca			
# Teaching Spaces	Space Size (ea.)	Change +/-	Notes
0			
0			
0			
0			
0			
8	717 sf	136 sf +	shared TLTs
6	717 sf (3), 834 sf	947 sf -	shared TLTs
6	834 sf	596 sf -	shared TLTs
0			
0			
20			
1	834 sf	66 sf -	converted classroom
0			
0			
0			
0			
0			
0			
0			
0			
0			
0			
0			
0			
0			
1	1116 sf	116 sf +	shared with PE office
0			
1	2844 sf	3156 sf -	
0			on stage
0			
0			
0			
0			
0			used for instr. music/PE office
0			
1	834 sf	234 sf +	shared w/ reading, converted CR
1	332 sf	418 sf -	shared with speech
0			

Existing Conditions - Old Post Road			
# Teaching Spaces	Space Size (ea.)	Change +/-	Notes
3	1050 sf, 1070 sf, 996 sf	1116 sf +	
10	848 sf, 1050 sf (2), 1070 sf, 1026 sf (2) (ind .TLT) / 808 sf, 900 sf, 991 sf, 974 sf (shared TLTs)	943 sf +	
8	676 sf (3), 619 sf (3), 663 sf, 632 sf	420 sf -	(no TLTs)
8	805 sf (4), 663 sf, 676 sf, 632 sf, 619 sf	10 sf +	shared TLTs
0			
0			
0			
0			
0			
29			
1	928 sf	28 sf +	converted classroom
0			
0			
1	728 sf	72 sf -	
0			
0			
1	2160 sf	3840 sf -	
1	104 sf	46 sf -	
0			
2	165 sf, 120 sf	15 sf -	
0			
0			
0			
0			
0			used for Sp Ed, Keypoint
0			
0			
0			
0			

1063 Student Capacity (medium) continued

<b>Special Education</b>			7			
Classrooms w/ Toilets	10	2	2	20	660	1320
Resource Room			1		300	300
Resource Testing Room			1		100	100
Occupational/ Physical Therapy			1		250	250
Early Childhood Intervention	10	2	2	20	1000	2000
<b>Primary Elementary Core</b>			5			
LAUNCH			1		660	660
SIPPS			1		800	800
I Station			1		800	800
Math Intervention			1		660	660
Teacher Mentor			1		150	150
<b>Upper Elementary Core</b>			4			
SIPPS			1		800	800
I Station			1		800	800
Math Intervention			1		660	660
Teacher Mentor			1		150	150
<b>Media Center</b>			6			
Circulation Desk/Main Reading Area/Instructional Area			1		2150	2150
Office/Work Space/ Inst. Prep			1		700	700
Retrieval			1		100	100
Storage			1		450	450
TV Studio			1		450	450
Computer Laboratory (Tiered)			1		800	800
<b>Cafeteria</b>			4			
Cafeteria			1		5000	5000
*Kitchen			1		2000	2000
Storage (dry)/Receiving Area			1		500	500
After School Program Storage			1		100	100
*YBES to have satellite kitchen						
<b>Faculty Lounge/PTA</b>			11			
Teacher Planning Areas w/Toilet			6		450	2700
Teacher Lounge			1		500	500
Lavatory (unisex in lounge)			2		50	100
PTA Workroom			1		450	450
Office			1		100	100
<b>Administration</b>			16			
Reception/Secretarial Area			1		600	600
Principal's Office w/ Toilet			1		300	300
Assistant Principal Office			2		150	300
Assistant Principal Conference Rooms			2		250	500
In-School Suspension			1		45	45
Workroom			1		300	300
Records Room			1		150	150
Toilet			1		60	60
Conference Room			1		250	250
Administration Office			1		100	100
Instructional Facilitator - Office			1		150	150
Family Liaison Conference Room			1		250	250
Teacher Specialist Conference Room			1		250	250
Office (for four Title 1 staff)			1		300	300

1	435 sf	2205 sf -	no TLT			
1	386 sf	86 sf +	Sp ED office			
0						
0						
0						
0						
0						
0						
0						
0						
0						
0						
0						
0						
0						
0						
0						
1	2637 sf	487 sf +				
1	683 sf	17 sf -	shared w/ enrichment			
0						
0						
0						
1	688 sf	162 sf -	not tiered			
1	3939 sf	1061 sf -				
1	1247 sf	753 sf -				
1	179 sf	321 sf -				
0						
0						
1	524 sf	24 sf +	no water, no kitchenette			
0						
0						
0						
0						
1	558 sf	42 sf -				
1	222 sf, 32 sf (TLT)	46 sf -				
1	222 sf	78 sf -	has TLT			
0						
0						
0						
0						
0						
1	221 sf	29 sf -	has TLT			
0						
0						
0						
0						

2	210 sf, 935 sf	1495 sf -	shared w/ Keypoint, ChildFind			
1	324 sf	24 sf +				
0						
0						
0						
0						
0						
0						
0						
0						
0						
0						
0						
1	2238 sf	88 sf +				
0						
0						
0						
1	341 sf	509 sf -	not tiered			
1	2640 sf	2360 sf +				
1	513 sf	1487 sf -				
1	179 sf					
0						
0						
1	256 sf	244 sf -	no water, no kitchenette			
0						
1	536 sf	64 sf -				
1	155 sf	145 sf -	no TLT			
1	170 sf	130 sf -				
0						
0						
0						
2	44 sf each	28 sf +	men's and women's			
1	210 sf	40 sf -				
0						
1	218 sf	68 sf +				
0						
0						

1063 Student Capacity (medium) continued

<b>Student Services Suite/Guidance</b>			10		
Counselor's Office			2	150	300
Itinerant Teaching/Diagnostic Area/Psych. Off.			1	175	175
Toilet			1	60	60
Recept. Conference Room			1	300	300
Speech room			2	150	300
Keypoint Mental Health			1	150	150
Office			1	150	150
ESOL			1	150	150
<b>Health Suite</b>			6		
Waiting/ Reception			1	110	110
Office			1	150	150
Exam/Treatment Room			1	420	420
Rest Areas			1	130	130
Toilet			1	90	90
School Health Readiness			1	300	300
<b>Custodial Services</b>			1		
Office			1	350	350
<b>Additional Programs</b>			1		
PDSA (Towson Program)			1		
<b>TOTAL NUMBER OF ROOMS</b>					
Academic (Classrooms, etc)			98		
Art			5		
Music			5		
Physical Education			7		
Specialist's Area			5		
Special Education			16		
Media Center			6		
Cafeteria			4		
Faculty Lounge/Planning			11		
Administration			16		
Student Services Suite/Guidance			10		
Health			6		
Custodial Services			1		
Storage			1		
<b>TOTAL # TEACHING STATIONS</b>					
<b>TOTAL NUMBER OF ROOMS</b>			191		
<b>TOTAL NET PROGRAM AREA</b>				1063	91,600
<b>STATE RATED CAPACITY</b>				1149	
<b>TOTAL GROSS BUILDING AREA</b>					142,896
<b>GROSS EFFICIENCY</b>					64%

1	323 sf	23 sf +		shared w/ Keypoint	
0					
0					
0					
0				shared w/ reading room	
0					
0					
0					
0					
0					
0					
0					
0					
0					
1	221 sf	199 sf -			
0					
1	32 sf	58 sf -			
0					
0					
0					
0					
0					
0					
0					
0					
0					
0					

1	144 sf	156 sf -			
0					
0					
0					
2	188 sf, 198 sf	86 sf +		converted closet	
0					
0					
0					
0					
0					
0					
0					
0					
0					
1	194 sf	226 sf -			
0					
1	21 sf	69 sf -			
0					
0					
0					
0					
0					
0					
0					
0					
0					
0					
0					
1	324 sf	26 sf -			
0					
0					
0					
0					
0					
0					
0					
0					
0					

Appendix C - Programs

926 Student Capacity (small)

Activity/Program	Proposed WP/OPR Elementary School Program - 926 Students					
	State Classroom Capacity	#Teaching Stations	# Rooms	Total # of Students	Ed. Spec. Size (ea.)	Total
<b>PRIMARY BUILDING</b>						
<b>Academic (Classrooms, etc)</b>						
Pre-Kindergarten w/ Toilets (Full Day)	20	2	2	40	1000	2000
Pre-Kindergarten w/ Toilets (Half day)	20	1	1	40	1000	1000
Kindergarten (full day) w/ Toilets	22	7	7	154	1100	7700
Grade 1 Classrooms w/ Toilets	23	6	6	138	850	5100
Grade 2 Classrooms w/ Toilets	23	6	6	138	850	5100
Grade 3 Classrooms	23	6	6	138	800	4800
Grade 4 Classrooms	23	6	6	138	800	4800
Grade 5 Classrooms	23	6	6	138	800	4800
Flexible Classrooms (One w/ Toilet)	22	1	1	22	850	850
Flexible Classrooms	23	2	2	46	800	1600
<b>Total # of Classrooms/ Students</b>			43	926		

<b>TOTAL NUMBER OF ROOMS</b>						
Academic (Classrooms, etc)			86			
Art			5			
Music			5			
Physical Education			7			
Specialist's Area			5			
Special Education			16			
Media Center			6			
Cafeteria			4			
Faculty Lounge/Planning			11			
Administration			16			
Student Services Suite/Guidance			10			
Health			6			
Custodial Services			1			
Storage			1			
<b>TOTAL # TEACHING STATIONS</b>						
<b>TOTAL NUMBER OF ROOMS</b>			179			
<b>TOTAL NET PROGRAM AREA</b>				926		86,400
<b>STATE RATED CAPACITY</b>					1149	
<b>TOTAL GROSS BUILDING AREA</b>						134,784
<b>GROSS EFFICIENCY</b>						64%

Appendix C - Programs

1154 Student Capacity (large)

Activity/Program	Proposed WP/OPR Elementary School Program - 1154 Students					
	State Classroom Capacity	#Teaching Stations	# Rooms	Total # of Students	Ed. Spec. Size (ea.)	Total
<b>PRIMARY BUILDING</b>						
<b>Academic (Classrooms, etc)</b>			106			
Pre-Kindergarten w/ Toilets (Full Day)	20	2	2	40	1000	2000
Pre-Kindergarten w/ Toilets (Half day)	20	1	1	40	1000	1000
Kindergarten (full day) w/ Toilets	22	9	9	198	1100	9900
Grade 1 Classrooms w/ Toilets	23	8	8	184	850	6800
Grade 2 Classrooms w/ Toilets	23	8	8	184	850	6800
Grade 3 Classrooms	23	8	8	184	800	6400
Grade 4 Classrooms	23	7	7	161	800	5600
Grade 5 Classrooms	23	7	7	161	800	5600
Flexible Classrooms (One w/ Toilet)	22	1	1	22	850	850
Flexible Classrooms	23	2	2	46	800	1600
<b>Total # of Classrooms/ Students</b>			53			

<b>TOTAL NUMBER OF ROOMS</b>						
Academic (Classrooms, etc)			106			
Art			5			
Music			5			
Physical Education			7			
Specialist's Area			5			
Special Education			16			
Media Center			6			
Cafeteria			4			
Faculty Lounge/Planning			11			
Administration			16			
Student Services Suite/Guidance			10			
Health			6			
Custodial Services			1			
Storage			1			
<b>TOTAL # TEACHING STATIONS</b>						
<b>TOTAL NUMBER OF ROOMS</b>			199			
<b>TOTAL NET PROGRAM AREA</b>				1154		95,200
<b>STATE RATED CAPACITY</b>					1149	
<b>TOTAL GROSS BUILDING AREA</b>						148,512
<b>GROSS EFFICIENCY</b>						64%



## Appendix D - Sustainable Design

Throughout this document specific items are referenced that will provide a high performance, sustainable facility. Although not required to achieve a specific Leadership in Energy and Environmental Design (LEED®) or Green Globe® rating, the design and construction should consider the following criteria:

### Site

The existing site offers many opportunities to illustrate environmental stewardship in ways that maximize the best attributes of the property while improving overall function and aesthetic appeal through:

- Minimizing site disruption and attendant soil erosion and air pollution associated with construction activities.
- Protecting against prevailing winter winds and undesirable solar gain by landscaping for energy conservation.
- Providing landscaping that promotes wildlife, songbirds, etc.
- Adding heritage trees species using community involvement.
- Letting portions of the site revert back to its native state. Balance the need of carefully manicured lawn areas with less labor, energy and material intensive natural areas, especially around the boundary of the property.
- Declaring the site a chemical free zone. Eliminate the use of pesticides, herbicides, etc. in order to promote protection of regional watersheds.
- Balancing any required cut and fill, and minimizing site disturbance to the greatest extent possible.
- The building additions and renovations or new construction implementing the use of daylight throughout.
- Examining alternative energy systems such as photovoltaic arrays for their role as potential pedestrian walkway shading devices and as inclement weather protection in addition to or in lieu of roof mounted.
- Energy efficient site lighting utilized to maximize security while minimizing wasted light.



### Water Efficiency

Due to the large roof area of the existing building or a new building (in excess of 275,000 sf) there is the opportunity for the building to be 75%-100% water self sufficient. This would be a major accomplishment and an equally significant resource benefit over the life cycle of the building. A number of water harvesting and water conservation strategies should be considered. This involves the following:

- Evaluating rain water potential. The goal is to reduce the reliance on municipally supplied water and the carbon cost of treating that water.
- Maximize water conservation. This is something that has great educational value, and can be made visible to the student body and community.
  - Eliminate the use of potable water for irrigation.
  - Low flush fixtures using rainwater recharge.
  - Low flow shower heads.
  - Recycled water for mechanical system recharge.
  - Recycle mechanical system condensate.
- Manage and conserve storm water. The site offers numerous ways to manage storm water and reduce negative impacts on downstream storm water management and capacity in the community.
  - Consider installing a low profile vegetative roof to reduce the amount and rate of storm water coming from the building roof. The area under the roof is very significant. We want to turn this potential detriment into a positive design element. Rain water can be harvested for many other uses.
  - Designing the parking lots and paved surfaces to be as pervious as practical, and implement on site storm water detention under paved areas to recharge ground water.
  - Using retention and detention ponds as educational tools and illustration of the role of natural ecology in development.



### Energy and Atmosphere

This building should be designed to be a very energy efficient facility. This will be based on the fundamentals of good solar orientation, building circulation and layout, and optimum building design based on computer analysis of integrated building systems. Sustainable design calls for the building enclosure to be well suited to microclimate and building site, with primary reliance on natural systems. Some strategies to achieve this goal include:

- Computer modeling used to inform the design process and optimize building systems. Annual energy savings and yearly operating cost reduction goal should be a minimum of 30% over an American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 90.1-2004 compliant building.
- The building should be zoned and controlled in a way specific to occupancy and use profiles. These systems will recognize the mass and building characteristics of the building as well as control logic designed to maximize the return on investing in these systems.
- All building system components selected will be free of chlorofluorocarbons (CFCs) and hydro chlorofluorocarbons (HCFCs).
- Daylighting should be a major design driver, along with intelligent controls of electric lighting that recognize the amount of useful daylight present in each space.
- Natural ventilation should be used where possible.
- Mechanical ventilation should be decoupled from space conditioning to ensure fresh air and energy recovery independent of space conditioning requirements.
- Certain spaces such as the natatorium, cafeteria, and auditorium will be analyzed and scrutinized for energy and building system application specific to their occupancy and use.
- The project should incorporate full enhanced building system commissioning to insure that the design intent will be met.





### Materials and Resources

The presence of the existing building and associated vehicular and pedestrian circulation ways present both challenges and opportunities to compose a design which is energy, material and resource efficient. A potential solution that would tend to maximize resource efficiency and building performance would be to combine the partial deconstruction of select areas of the existing facility, with the reuse of existing portions of the remaining school facility and new construction. The sustainable design and development issues to consider include:

- Recycling as much of the deconstructed building as possible. The intent is to keep construction debris out of landfills and route salvaged materials to other projects in the area. The project goal should be to divert a minimum of 80% of the deconstructed material out of landfills.
- Contacting local, regional and national organizations to retrieve materials that can be salvaged for use in other projects. This is one significant way in which materials can be kept out of landfills.
- Reuse as much of the existing building as practical. This portion of the existing building selected to be reused should be brought up to the highest standards of sustainable design possible given existing conditions.
- Provide space for the collection, storage and redistribution of recycled materials. This effort will be aided by an increased awareness of the waste stream of the school and how a larger part of the waste stream can be salvaged.
- Using materials and labor available in the region (< 250 miles), and with a high recycled or post consumer material content.

### Indoor Environmental Quality (IEQ)

Sustainable design places a premium on the health, comfort and safety of building occupants. This is particularly critical with respect to school children and others who do not have the choice or ability to modify or change their daily environment. Interior Environmental Quality issues incorporated in the design and construction of this building should include:

- A smoke free school zone.
- Using caution during construction to safeguard building occupants. The goal is to not subject anyone to the potentially harmful effects of construction debris, pollution and activities.
- Selecting materials that do not off-gas harmful vapors or otherwise contribute to interior air pollution.
- Adopting an allergy free, non-toxic cleaning and maintenance regimen using only environmentally friendly products and practices.
- Recognizing the importance of adequate fresh air, natural ventilation and the ability to conveniently use outdoor spaces as effective instruction areas.



### Indoor Environmental Quality (IEQ) continued

- Incorporating walk off mats, entrance grates and other design features that limit the amount of contaminants tracked in from outdoors.
- Carbon dioxide (CO<sub>2</sub>) monitors that inform the building controls to insure adequate amounts of ventilation where and when needed.
- Effective use of natural light complimented by well designed electric lighting.
- Using color, texture and pattern to create effective learning environments.
- A mold free environment.

### The school as a teaching tool.

The school building itself must be designed as an extension of the curriculum. The design must provide ways to make various building systems and design features promote and enhance the learning of how building occupants, the natural world, and the built environment interact.

### Pushing resource conservation in critical categories.

For instance, making water self sufficiency a primary goal.

### Community outreach and involvement.

Actively involve the community and staff in the ongoing operation and evolution of Northeast High School as a progressive teaching environment and ambassador of good will in the community. Some suggestions to accomplish this are:

- Making the site available for community activities. Use of the media center both during and after regular school hours; constructing native habitats that incorporate garden walks and interpretive trails; etc.
- Make site extremely accessible to adjacent neighbors by designing connections to walking paths and interpretive trails.
- Establishment of a memorial arboretum or memorial tree program to increase the beauty and diversity of the site.
- Many other possibilities exist and should be exploited.



## Appendix E - Building Security and Site Safety

Building will employ established Crime Prevention through Environmental Design (CPTED) principles such as natural surveillance and access control, formed surveillance, territoriality defensible hardening, and program interactions in school design. These strategies include, but are not limited to:

- **Natural Surveillance** - A design concept directed primarily at keeping intruders easily observable. Promoted by features that maximize visibility of people, parking areas and building entrances: doors and windows that look out on to streets and parking areas; pedestrian-friendly sidewalks and streets; front porches; adequate nighttime lighting.
- **Territorial Reinforcement** - Physical design can create or extend a sphere of influence. Users then develop a sense of territorial control while potential offenders, perceiving this control, are discouraged. Promoted by features that define property lines and distinguish private spaces from public spaces using landscape plantings, pavement designs, gateway treatments, and “CPTED” fences.
- **Natural Access Control** - A design concept directed primarily at decreasing crime opportunity by denying access to crime targets and creating a perception of risk for offenders. Gained by designing streets, sidewalks, building entrances and neighborhood gateways to clearly indicate public routes and discourage access to private areas with structural elements.
- **Target Hardening** - Accomplished by features that prohibit entry or access:, such as window locks, dead bolts for doors, and interior door hinges.

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