

**BOARD OF EDUCATION OF HOWARD COUNTY
MEETING AGENDA ITEM**

TITLE: Wilde Lake Middle School Construction Documents Report **DATE:** December 15, 2014

PRESENTER(S): Scott W. Washington, Director, School Construction

VISION 2018 GOAL: ☒ Students ☐ Staff ☐ Families and Community ☐ Organization

OVERVIEW:

The attached construction document report describes the new replacement school for Wilde Lake Middle School. Wilde Lake Middle School opened in 1969 with an open classroom design for Grades 6 through 8. The school, a single story building with masonry exterior wall construction, has had one building addition and one major renovation in 1975 and 1996, respectively.

This project, the sixth iteration and adaptation of the current middle school prototype design based on the General Educational Specifications for new Howard County Middle Schools, will be constructed directly behind the existing school. Not only will this be another Leadership in Energy and Environmental Design (LEED) “Gold” school for the county, it will also hold the distinction of being the county’s first Net Zero Energy school in the state.

Since the construction document presentation, several refinements have been made to finalize the design as a result of meetings with the Howard County Public School System staff, Maryland Emergency Management Agency, local code authorities and the Howard County Public School System Staff design team. These refinements include but are not limited to reconfiguration of the locker room support spaces, removal of the technology education dust collection system, modification of the media center glazing to provide permanent AV equipment spaces, and an outdoor classroom in the rear of the school.

Working in collaboration with other local stakeholders, staff reviewed establishing future neighborhood pathways to foster improved community continuity, further highlighting the school as another aspect of revitalization and renewal in the area.

RECOMMENDATION/FUTURE DIRECTION:

It is recommended that the construction document report for Wilde Lake Middle School be approved as submitted.

SUBMITTED BY:

Scott W. Washington
Director
School Construction

APPROVAL/CONCURRENCE:

Renee A. Foose, Ed. D.
Superintendent

Susan C. Mascaro
Chief of Staff

Camille B. Jones
Chief Operating Officer

Bruce Gist
Executive Director
Facilities, Planning and
Management



View of main entrance of net zero energy prototype middle school

Construction Document Report

(NEW) WILDE LAKE MIDDLE SCHOOL
Howard County Public School System

tca | architects

Annapolis, Maryland 410-841-6205

December 15, 2014

Annapolis, Maryland

Specializing in the design of educational facilities

Construction Document Report (New) Wilde Lake Middle School

FOR THE BOARD OF EDUCATION OF HOWARD COUNTY:

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December 15, 2014

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Schematic Planning Advisory Committee

Planning Committee

Joyce Agness	HCPSS, Instructional Facilitator, MS/Special Education
Heather Bartham	Wilde Lake Middle School, PTA President
Mike Borkoski	HCPSS, Technology Officer
Robert Coffman	HCPSS, Instructional Facilitator, Secondary Social Studies
Gary Davis	HCPSS, Construction Project Manager
Marie DeAngelis	HCPSS, Director of Elementary Curricular Programs
Frank Eastham	HCPSS, School Administration
Tonge Enoch	Wilde Lake Middle School, Student Representative
Peter Gaylord	Wilde Lake Middle School, Assistant Principal
Bruce Gist	HCPSS, Director of School Construction
Annette Grzybinski, RN	Wilde Lake Middle School, Cluster Nurse
Marcy Hersl	HCPSS, Analyst, Safety, Environment & Risk Management
Dan Keiser	HCPSS, Construction Program Manager
Lindsay Kelley	Wilde Lake Middle School, Math Instructional Support
Phil Lindberg	Wilde Lake Middle School, Parent
Wendy McNeill	Wilde Lake Middle School, Media Specialist
Dave Messick	Wilde Lake Middle School, Band Director
Ron Miller	HCPSS, Manager of Safety, Environment & Risk Management
Dr. Eric Minus	HCPSS, Administrative Director of Middle Schools
April Motaung	Wilde Lake Middle School, G/T Resource Teacher
Tiffanie Nunley	WLMS, Instructional Team Leader, Special Education
Nichelle Parker	Maryland Energy Administration, Program Manager
Judith Pattik	HCPSS, Coordinator, Special Education
David Ramsay	HCPSS, Director of Transportation
Ken Roey	HCPSS, Chief Facilities Officer
Bala Srin	Maryland Energy Administration, Energy Program Consultant
Lisa Smithson	Wilde Lake Middle School, Principal
Michael Walsh	Wilde Lake Middle School, Science Teacher
Scott Washington	HCPSS, Manager of Design & Pre-Construction Services
Ann Yetter	Wilde Lake Middle School, Principal's Secretary
Betsy Zentz	HCPSS, Interagency Specialist

Architects

Mike Lahowin, AIA	Principal, LEED AP
Robyn Toth, AIA	Associate Principal, Project Manager, LEED AP
Michael Smith, RA	Staff Architect, LEED AP

Design Team

ARCHITECT	TCA Architects	Annapolis, MD
CIVIL ENGINEER	Fisher, Collins & Carter, Inc.	Ellicott City, MD
STRUCTURAL ENGINEER	Johnson Engineering Assoc.	Darnestown, MD
M/E/P ENGINEER	James Posey Associates	Baltimore, MD
DAYLIGHTING ENGINEER	EMO Energy Solutions	Falls Church, VA
ROOFING CONSULTANT	Gale Associates, Inc.	Baltimore, MD
ACOUSTICAL ENGINEER	Miller, Beam & Paganelli, Inc.	Reston, VA
FOOD SERVICE DESIGN	Nyikos Associates	Gaithersburg, MD
SOLAR PV ENGINEER	SepiSolar, Inc.	Sausalito, CA
CONSTRUCTION MANAGER	Oak Contracting	Towson, MD

Design Development Phase Participants

HCPSS

Maha Abdelkader ESOL, Acting Coordinator
 Julie Alonso Hughes IT, Coordinator
 Bill Barnes Secondary Math, Coordinator
 Richard Bilenki Master Plumber
 Mike Borkoski Director of Technology
 Olivia Claus Manager,
 Custodial Services
 Nancy Czarnecki Secondary Language Arts,
 Instructional Facilitator
 Gary Davis Construction Project Manager
 Frank Eastham School Administration
 Terry Eberhardt Music, Instructional Facilitator
 Clarissa Evans Secondary Curriculum,
 Executive Director
 Carol Fritts Career and Technology
 Education, Coordinator
 Rob Geelhaar HVAC Leadman
 Bruce Gist Acting Executive Director
 Facilities Planning and
 Management
 Joe Goins Master Electrician
 Melissa Grabill LM, Instructional Facilitator
 Leslie Grahn World Languages,
 Coordinator
 Laurel Johnson Area Field Representative,
 Food Services
 Dan Keiser Construction Program
 Manager
 Lisa Katz DEP
 Hummy Khan Assistant Manager, Building
 Services
 Mary Klatko Former Director, Food &
 Nutrition Services
 Sam Knight Boilers Specialist
 Pat McCord Asst. Manager, Systems
 Engineering Services
 Kathryn McKinley Acting Director, Secondary
 Curricular Program
 Gino Molfino Fine Arts, Coordinator
 Eric Minus Administrative Director of
 Middle Schools
 Jonathan Naill Maintenance
 Linda Rangos Health-PE, Coordinator
 Geordie Paulus IT, Resource Teacher
 Larry Phebus Master Electrician
 Keith Richardson Manager,
 Grounds Services
 Ken Roey Chief Facilities Officer
 Sarah Russo Library Media Specialist
 Herb Savje Manager, Building Services
 Mike Senisi PE, Instructional Facilitator
 Dave Shaw Network Operations,
 Manager
 Diane Sweeney Energy Management
 Specialist
 Ed Voland AV Technician
 Scott Washington Manager of Design &
 Preconstruction Services
 Mary Weller Secondary Science,
 Coordinator
 Jeff Wetzel Carpentry, Building Services
 Jon Wray Secondary Math,
 Instructional Facilitator

WILDE LAKE MIDDLE SCHOOL

Laura Attridge Social Studies Teacher
 Karen Baldwin Family & Consumer Sciences
 Marion Carter Technology Education
 Kathy Corbett Alternative Education
 Renee Cornelius Guidance Department
 Annette Grzybinski Cluster Nurse
 Maggie Kapustin World Languages Teacher
 Lindsay Kelly Math Teacher
 Rhonda Kershaw ESOL Teacher
 Brett Lebowitz English Language Arts Team
 Leader
 Lee McMillan Health Teacher
 Wendy McNeill Former Media Specialist
 Dave Messick Band Director
 April Motaung G/T Resource Teacher
 Tiffanie Nunley Instructional Team Leader,
 Special Education
 Sarah Russon Media Specialist
 April Simpson Art Teacher
 Lisa Smithson Principal
 Steve Tiffany Physical Education Teacher
 Mike Walsh Science Teacher
 Emily Warner Reading Specialist
 Ann Yetter Principal Secretary

MEA

David Comis Energy Program Consultant
 Tony Hans MEA Supporter, CMTA
 Wyck Knox MEA Supporter, VMDO
 Nichele Parker Energy Program Manager
 Ken Seibert MEA Supporter, CMTA
 Bala Srin Energy Program Consultant
 Asato Tashiro MEA Supporter, CMTA

DESIGN TEAM

Chuck Crovo Civil Engineer
 Bob Johnson Structural Engineer
 Mike Lahowin TCA Architects, Principal
 Dale Madeiry Civil Engineer
 Patrick Marquez Electrical Engineer
 Rob Nyikos Kitchen Consultant
 Mike Smith TCA Architects
 Mike Sherren Mechanical Engineer
 Robyn Toth TCA Architects,
 Associate Principal

CONSTRUCTION MANAGEMENT

Jim Fowler Oak Contracting,
 Steve Krell Oak Contracting
 Ed Lurz Oak Contracting
 Matt Lurz Oak Contracting
 Wayne Temple Oak Contracting
 Joe Tiberi Oak Contracting

Construction Document Phase Participants

HCPSS	Richard Bilenki	Master Plumber
	Tony Bonomo	Assistant Manager, Building Services
	Mike Borkoski	Director of Technology
	Robert Coleman	Electronics
	Greg Connor	Assistant Manager, Grounds Services
	Rosalie Edwards	Food Services Area Field Representative
	Gary Davis	Construction Project Manager
	John DuVall	Electrician
	Glen Fowler	Building Services, HVAC
	Bruce Gist	Executive Director, Facilities, Planning and Management
	Joe Goins	Master Electrician
	Kevin Hill	Assistant Manager, Telecom
	Dan Keiser	Construction Program Manager
	Hummy Khan	Assistant Manager, Building Services
	James LeMon	Wilde Lake High School, Principal
	Al Mullinex	Building Services
	Jonathan Naill	Maintenance
	Larry Phebus	Master Electrician
	Mike Senisi	Physical Education, Instructional Facilitator
	Dave Shaw	Manager, Network Operations
	Lisa Smithson	Wilde Lake Middle School, Principal
	Don Spindler	Electrician
	Remy Toledo	Assistant Manager, Network and Audio Visual Services
	Scott Washington	Director of School Construction
	Ann Yetter	Wilde Lake Middle School, Principal's Secretary
	Betsy Zentz	Interagency Specialist
HOWARD COUNTY	Sean Alliger	Howard County Fire and Rescue Services, Captain
	Andrew Arnold	DILP, Fire Protection Engineer
	Bruce E. Bennet	Howard County Fire and Rescue Services
	Chris Eatough	Planning Supervisor, Bicycle & Pedestrian Coordinator
	Syd Garrot	DILP, Plan Examiner
	Jim Hobson	DILP, Engineering Specialist
	Adolphe Hurlaux	DILP, Plan Examiner
	Kevin McAliley	Village Board of Directors, Chair
	Dan Merson	Howard County Fire and Rescue Services, Assist. Captain
	Don Mock	DILP, Chief of Plan Review
	Benjamin Pickar	Planning Supervisor
	Charles Ridsek	Howard County Fire and Rescue Services
	Martin S. Schumacher	DILP, Plan Examiner
	Mark Thompson	Director of Downtown Redevelopment
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	David Comis	Energy Program Consultant, SRA
	Bob Crowell	MEA Reviewer, 2RW
	Gary Hagan	MEA Supporter, CMTA
	Wyck Knox	MEA Supporter, VMDO
	Nichele Parker	Energy Program Manager
	Ken Seibert	MEA Supporter, CMTA
	Bala Srin	Energy Program Consultant, DVA
	Rob Winstead	MEA Reviewer, Stantec
ARCHITECTS	Mike Lahowin	TCA Architects, Principal
	Robyn Toth	TCA Architects, Associate Principal

Project Description

The new Wilde Lake Middle School will be constructed directly behind the existing Wilde Lake Middle School. This building will be an adaptation of the current prototype middle school design and is designed to accommodate a population of 752 students.

The 'Space Analysis' section of this report contains a complete listing and size of every space included in this middle school design.

The Howard County Public School System (HCPSS) has elected to take advantage of the Net Zero Schools Initiative grant provided by the Maryland Energy Administration (MEA) to modify the prototype middle school design to significantly reduce energy consumption and to produce the balance of the energy required to run the building on site. This will be accomplished by the installation of solar photovoltaic (PV) panels located on the school's roof and site. (See page 9 for more on Net Zero Energy Design.)



It is the intent that the design and construction of this new middle school achieve a Leadership in Energy and Environmental Design (LEED) 'Gold' designation making this facility yet another 'Green' school for the HCPSS. The 2009 version of 'LEED for Schools' released by the U.S. Green Building Council (USGBC) will provide the necessary goals and requirements to obtain LEED Certification. (See page 8 for Sustainable 'Green' Design Goals.)

Project Facts

	Existing <u>Wilde Lake MS</u>	New <u>Wilde Lake MS</u>
Total size of site	± 15.0 acres	± 15.0 acres
On site car parking provided	68 cars	108 cars
On site bus parking provided	15 busses	15 busses
Building Square Footage	70,530 gsf	106,221 gsf
Student Capacity	506 Students	752 Students *
* 712 + 40 special education students		

Project Schedule

Schematic Planning Meeting Completed	March 10, 2014
Schematic Design Approved by the Board of Education	April 10, 2014
Design Development presented to Board of Education for Review and Approval	August 14, 2014
Construction Documents presented to Board of Education for Review and Approval	December 15, 2014
Project out for Bids: (1 month)	February 2015
Bids Received	March 2015
Construction Starts	May 2015
Construction Completed (27 months)	August 2017

Continuation of the School Design Process

This construction document report is intended to explain and illustrate those aspects of the Wilde Lake Middle School design which have changed since the design development report.

The planning process for the new Wilde Lake Middle School was described in detail in the schematic design report submitted to the Board and approved on April 10, 2014, and updated in the design development report submitted to the Board and approved on August 14, 2014. Following approval of the design development, a formal design development submittal was sent to the Maryland State Department of Education (MSDE) and later approved by them for continuation of the design process.

Noteworthy refinements to the project since the design development approval are noted below:

- A listing of all construction document phase participants can be found on page 5.
- List of modifications made to the HCPSS middle school prototype to achieve the Net Zero Energy goal for the project has been updated on page 10.
- Construction document phase site plan refinements are noted on page 14.
- Aerial view rendering has been updated to show more detail and all construction phase refinements to both the building and the site.
- Construction document phase floor plan refinements are noted on pages 17 and 18.
- Exterior building elevations have been updated on pages 22 and 23.
- The 'Space Analysis' on page 24 now includes the construction document square footages.
- The 'Cost Estimate' on page 27 has been updated by the construction manager for the construction document phase.

Noteworthy project development and coordination efforts:

Since the design development phase, a number of coordination meetings have continued to take place involving the Design Team, the Construction Manager, MEA, Baltimore Gas and Electric (BGE), the Department of Planning and Zoning, the Department of Fire and Rescue Services, the Wilde Lake Community Association and HCPSS staff. These meetings discussed aspects of the project that include, but are not limited to, the latest requirements for the fire department site access during each phase of construction, further development of proposed mechanical, electrical, and IT systems, further development of site and building construction phasing, analyzation of additional methods to reduce energy consumption, and the integration of future paths for the Columbia Association's pathway plan.

The site development plan has been submitted to Howard County Department of Planning and Zoning for final approval.

Sustainable 'Green' Design Goals

It is the intent that the design and construction of this new school achieve a LEED 'Gold' certification, making this facility a 'Green' school.

Simply stated, a 'Green' school is a building designed to conserve energy, water, and materials, thus reducing negative impacts on human health and the environment. A 'Green' learning environment provides natural daylight, enhanced classroom acoustics, improved indoor air quality, thermal comfort, and opportunities to integrate green features into the school's curriculum.

In order to measure and compare how 'Green' a building is, the USGBC, founded in 1993, has developed industry standards with design and construction rating systems and guidelines for many different building types.

One such rating system is the USGBC 2009 Edition of "LEED for SCHOOLS" to which the design will closely adhere. Final LEED certification levels are based on the number of credit points obtained in the "LEED for SCHOOLS" rating system. The four levels of certification from lowest to highest are: Certified, Silver, Gold, and Platinum.

We have included an 'in progress' LEED scorecard below which summarizes the credits most likely obtainable at this time. As the project continues to evolve, new credits may be possible while others may become increasingly difficult to engineer or too costly to provide. At this time we have identified 79 likely credits (with an additional '6 possible credits') allowing for the loss of some and still complying with the goal of a LEED 'Gold' Building with a remote chance of achieving a 'Platinum' level.



**LEED for Schools 2009 Scorecard
(New) Wilde Lake Middle School**

Sustainable Sites

Possible Credits: 16

- Prereq 1 **Construction Activity Pollution Prevention**
- Prereq 2 **Environmental Site Assessment**
- Credit 2 **Development Density & Community Connectivity**
- Credit 4.1 **Alternative Transportation, Public Transportation Access**
- Credit 4.2 **Alternative Transportation, Bicycle Use**
- Credit 4.3 **Alternative Transportation, Low Emitting Vehicles**
- Credit 5.2 **Site Development, Maximize Open Space**
- Credit 6.1 **Stormwater Design, Quantity Control**
- Credit 6.2 **Stormwater Design, Quality Control**
- Credit 7.2 **Heat Island Effect, Roof**
- Credit 10 **Joint Use of Facilities**

Water Efficiency

Possible Credits: 4

- Prereq 1 **Water Use Reduction, 20% Reduction**
- Credit 1 **Water Efficient Landscaping, No Potable Use or No Irrigation**

Energy and Atmosphere

Possible Credits: 30

- Prereq 1 **Fundamental Commissioning of Building Energy Systems**
- Prereq 2 **Minimum Energy Performance**
- Prereq 3 **Fundamental Refrigerant Management**
- Credit 1 **Optimize Energy Performance, 48% energy savings**
- Credit 2 **On-Site Renewable Energy, 13%**
- Credit 3 **Enhanced Commissioning**
- Credit 5 **Measurement & Verification**

Materials and Resources

Possible Credits: 7

- Prereq 1 **Storage & Collection of Recyclables**
- Credit 2 **Construction Waste Management, Divert 75% from Disposal**
- Credit 4 **Recycled Content, 20%**
- Credit 5 **Regional Materials, 20%**
- Credit 7 **Certified Wood**

Indoor Environment Quality

Possible Credits: 13

- Prereq 1 **Minimum IAQ Performance**
- Prereq 2 **Environmental Tobacco Smoke (ETS) Control**
- Prereq 3 **Minimum Acoustical Performance**
- Credit 1 **Outdoor Air Delivery Monitoring**
- Credit 3.1 **Construction IAQ Management Plan, During Construction**
- Credit 3.2 **Construction IAQ Management Plan, Before Occupancy**
- Credit 4.1 **Low-Emitting Materials, Adhesives & Sealants**
- Credit 4.2 **Low-Emitting Materials, Paints & Coatings**
- Credit 4.3 **Low-Emitting Materials, Flooring Systems**
- Credit 4.4 **Low-Emitting Materials, Composite Wood & Agrifiber Products**
- Credit 5 **Indoor Chemical & Pollutant Source Control**
- Credit 6.1 **Controllability of System, Lighting**
- Credit 6.2 **Controllability of System, Thermal Comfort**
- Credit 7.1 **Thermal Comfort, Design**
- Credit 7.2 **Thermal Comfort, Verification**
- Credit 8.1 **Daylight & Views, Daylight 75% of Classrooms**

Innovation and Design Process

Possible Credits: 5

- Credit 1.1 **Innovation in Design, Exemplary Performance SSc5.2**
- Credit 1.2 **Innovation in Design, Green Cleaning Program**
- Credit 1.3 **Innovation in Design, Exemplary Performance EAc1**
- Credit 1.4 **Innovation in Design, Exemplary Performance EAc2**
- Credit 2 **LEED Accredited Professional**

Regional Priority Credits

Possible Credits: 4

- Credit 1 **Regional Priority, SSc4.1**
- Credit 2 **Regional Priority, SSc6.2**
- Credit 3 **Regional Priority, EAc1**
- Credit 4 **Regional Priority, EAc2**

79 Total Credits (not including 6 maybe credits)

LEED for Schools 2009 Rating Scale:

Certified 40-49 Silver 50-59 Gold 60-79 Platinum 80-112

Net Zero Energy Design

A net zero energy building generates as much energy as it uses over the course of a year, as a result of extreme building system efficiencies and on-site renewable energy sources such as solar and geo-exchange systems. The HCPSS has elected to take advantage of a \$2,773,000 grant provided by the MEA to modify the prototype middle school design to significantly reduce energy consumption and then to generate the balance of energy needed to run the building on the school site. A total of \$2,240,000 can be used for the construction of the building, while the balance of the grant monies is allocated for the design. In order for a building to achieve zero energy without over-reliance on renewable energy, the design must get all the basics of sustainable design right.

According to a comparative study and analysis of eleven net zero energy schools titled "Zero Energy Schools - Beyond Platinum" by author/architect Paul C. Hutton, the fundamental design strategies necessary to achieve zero energy are:

1. Building Orientation and Massing:

Orienting the long axis of the building within 15 degrees of east-west axis results in energy savings by reducing heating loads on the building in the summer and by facilitating daylight harvesting. Buildings should also seek to utilize multi-story construction in lieu of single floor designs. Combining optimum orientation and massing can easily yield 15 percent energy savings.

2. Building Envelope:

By exceeding the current building code requirements for the thermal design of exterior walls and roofs, a well designed, constructed, and insulated building envelope can yield energy savings of 15 percent over minimal code compliant construction.

3. Daylighting:

Electric lighting can consume as much as 20 percent of the total energy use in a building. Substituting free daylight for costly electric light during the day, can reduce electric lighting energy by half with proper light dimming controls as discussed below.

4. Electric Lighting and Controls:

The first step to reduce energy use related to electric lighting is to minimize lighting power density (LPD) while maintaining comfortable interior lighting. This is accomplished through careful fixture selection and placement, as well as, automated controls such as occupancy sensors and dimming sensors in response to daylighting.

5. HVAC and Controls:

The combination of space heating, ventilation, and air-conditioning consume more energy than any other single component in a school building. It was found that geothermal systems reduce energy use substantially and were utilized in all but two of the eleven net zero energy schools in this study.

6. Occupant Behavior and Plug Loads:

Occupant behavior poses a challenge to school districts attempting to predict energy usage for the designer's energy model. No where is this more evident than in the effort to control potentially excessive and wasteful plug loads. Bringing in an appliance such as a small refrigerator; using incandescent desk lamps; neglecting to turn off computers and monitors each night or stores very little food in a large walk-in kitchen cooler while school is closed for the summer are all examples of staff behavior that can substantially increase energy consumption over the course of a year.

7. Renewable Energy:

Renewable energy sources on a school building or site are necessary in order to achieve Net Zero Energy. Photovoltaic (PV) panels, otherwise known as 'solar panels' and wind power are the two most commonly used technologies for renewable energy. It was found that PV panel systems were utilized in all but one of the eleven net zero energy schools in the study regardless of geographic, climatic, size or programmatic variation among each of the schools.

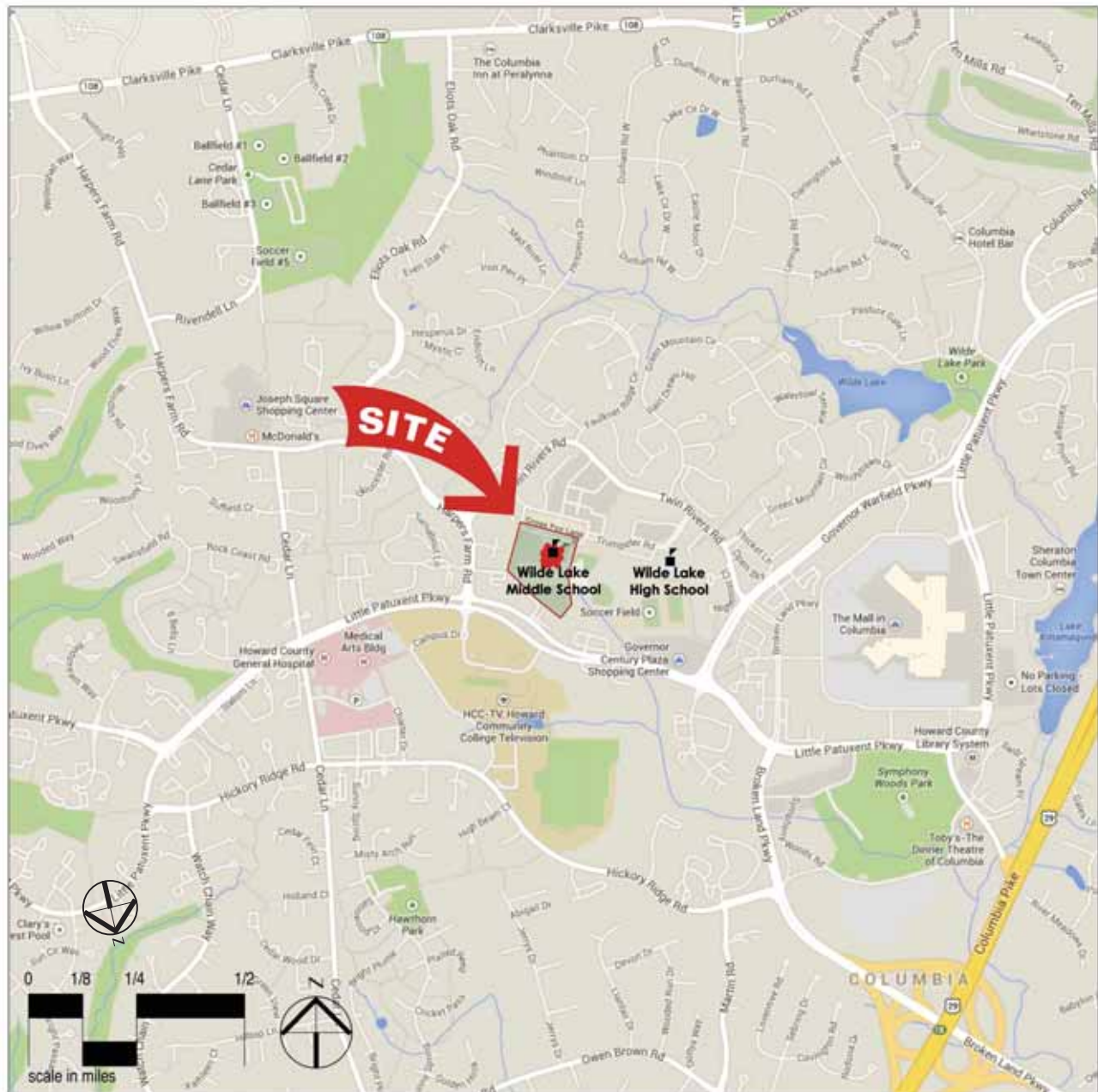
Net Zero Design for New Wilde Lake Middle School

As a result of pursuing a net zero energy building for the already energy efficient, prototype middle school design, some of the more noteworthy modifications and required upgrades for the new Wilde Lake Middle School design are listed below:

- A. The prototype geothermal system has been modified to a 'unitary' geothermal design for each room of the building. As a result, heat pump closets and a large centralized mechanical room have been added to the building.
- B. The storage and delivery of hot water throughout the school has been redesigned to consist of four heat pump type water heaters distributed in four small loops throughout the school. These water heaters have an extremely high level of production energy efficiency and their varied locations throughout the school will reduce pump energy associated with hot water recirculation.
- C. The building lighting plan has been redesigned to minimize the lighting power density by way of careful LED light fixture selection and placement. LED lighting has been utilized for all exterior building and site lighting. All interior lighting utilizes occupancy sensor controls as well as photocell dimming capabilities where required in large spaces with natural daylighting.
- D. The building design maximizes daylight opportunities while balancing the amount of wall and roof openings against the overall thermal building envelope goals and rooftop PV system design.
- E. The building envelope has been upgraded to provide a minimum of R-25 for the exterior walls by way of increased wall insulation, higher performing double-glazed windows and the use of thermally broken exterior doors and door frames. Sunshades have been added to all east, south and west-facing windows. The roof design will remain at the current minimum of R-30.
- F. The current roof structure design has been modified to support the additional PV panel loads of 10 lbs/s.f.
- G. Kitchen design includes the most energy efficient food service equipment, walk-in boxes that are configured so that only one door will open to kitchen and use demand defrost, refrigeration system with R-290 refrigerant, 'Energy Star' appliances, lower energy Type II exhaust hood, and boiler-less steamers.
- H. Entire PV panel system (both rooftop and at grade) has been designed and engineered.

Energy Use Index Comparison	
Existing Wilde Lake Middle School Building	66 kBTU/sf
Base Building per ASHRAE 90.1-2007/ LEED Minimum	51 kBTU/sf
Middle School No.20 (Thomas Viaduct Middle School)	38 kBTU/sf
Net Zero Goal Wilde Lake Middle School Replacement Building	25 kBTU/sf
Energy Use Index (EUI) is the measure of the total energy consumed in cooling or heating of a building during the course of a year, expressed in thousand British thermal unit (kBtu) per square feet (sf).	

Vicinity Map



The existing Wilde Lake Middle School is located on Cross Fox Lane in Columbia, Maryland, approximately one mile west of the Mall in Columbia.

Public water, sewer and natural gas serve the site.

Aerial Site Photo



The Wilde Lake Middle School site was originally developed for the school in 1969 and is currently shared with Wilde Lake High School. The middle school site elements utilize ± 15 acres of the shared site.

Wilde Lake Middle School is bordered to the north by a tennis club, to the west by a residential community, and to the south by a commercial area and to the east by Wilde Lake High School.

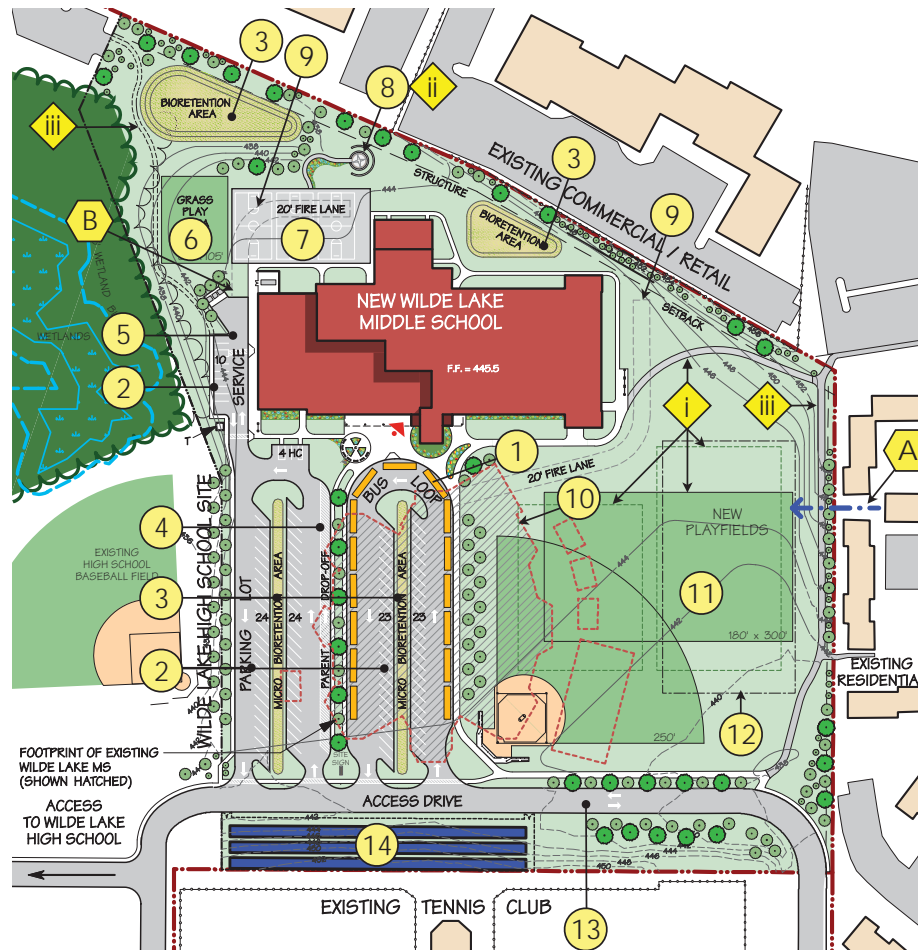
Note: The aerial site plan is rotated 180° from the vicinity map on page 11. North is facing the bottom of the page to match the orientation of the subsequent drawings in the report.

Existing Site Plan



Existing Site Conditions

1. The existing 70,000 sf Wilde Lake Middle School shares a site with Wilde Lake High School. The middle school utilizes approximately 15 acres of this combined site.
2. Access Drive is the only vehicular path to the middle school. It is a one-way road which is shared by busses and cars during student drop-off and pick-up, delivery trucks accessing the service area and cars parking for the middle school or traveling to the high school site.
3. 15 curbside bus spaces are provided on the one-way road in front of the school.
4. Steep slopes exist along the north and east property lines.
5. The number of existing staff parking spaces is inadequate. The number of parking spaces provided on the one-way road in front of the school and within the service drive totals 69 car parking spaces.
6. Existing baseball and softball fields.
7. Existing paved play area with two outdoor basketball courts.
8. Currently there are four portable classrooms on site; three to the west of the school and one on the east.
9. Existing multi-purpose play field.
10. It is anticipated that a large nine portable classroom unit, will be delivered to the site in January 2015 to accommodate the increase in student capacity at Wilde Lake Middle School which is projected to occur before the new school is built.

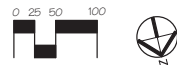
**SITE NOTES**

ZONING: NT (NEW TOWN)
ACRES: 14.9 ACRES

PARKING TABULATIONS

CAR SPACES = 108
(INCLUDING 5 HC SPACES)

BUS SPACES = 15

**Proposed Site Plan****Proposed Site Features**

- 1 Curbside bus parking for 15 busses. The bus driveway is separate from the parent drop-off driveway to reduce vehicular congestion on site.
- 2 108 parking spaces have been provided in three areas in an effort to provide as much car parking on site as possible.
- 3 Four potential locations have been designated for stormwater management bio-retention facilities.
- 4 Parent drop-off and pick-up area near the main entrance with ample queuing area to eliminate back-ups on the Access Drive in front of the school.
- 5 Service drive for access to kitchen and mechanical spaces and ten staff parking spaces.
- 6 Grass play area near the cafeteria for use during student recess.
- 7 Paved play area with three outdoor basketball courts adjacent to gymnasium and cafeteria.
- 8 Outdoor classroom area.
- 9 20' wide fire access lane.
- 10 Building footprint of existing Wilde Lake Middle School to be demolished and converted into parking lot, bus loop and playfields after the new Wilde Lake Middle School is occupied.
- 11 All playfields are accessible from the school without students crossing any vehicular roads or driveways.
- 12 Final location of new geothermal well field for heating, ventilation and air conditioning (HVAC) system, 120 wells $\pm 44,000$ sf.
- 13 Access Drive will be converted to a road with two-way traffic, which would provide two options for all vehicles entering and exiting the site.
- 14 Location of ground mounted solar photovoltaic (PV) panel field.

Design Development Site Plan Refinements

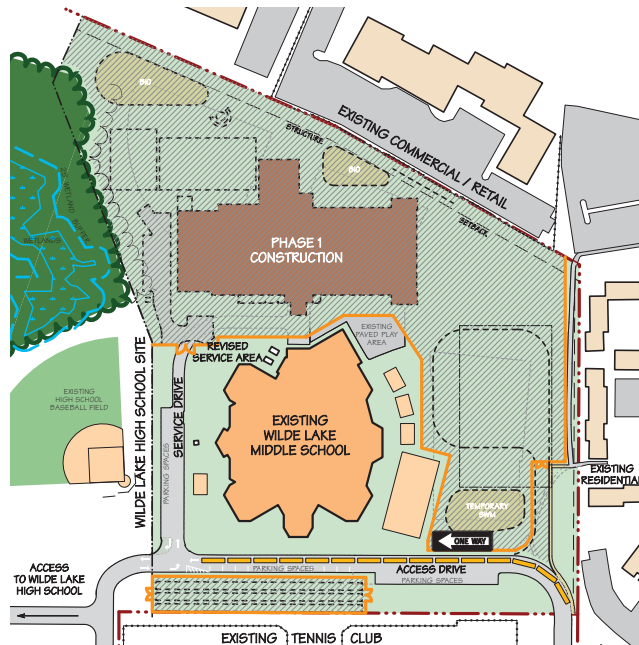
- A At the request of Howard County Planning and Zoning a second water service will be extended to the school site to create a looped water service for the school. The second water service requires the creation of a public water easement through the residential property to the point of water main connection.
- B At the request of the Fire Marshall, the outdoor equipment enclosure and the dumpsters have been moved to allow for the fire lane to continue onto the paved play area.

Construction Document Site Plan Refinements

- i At a meeting with the HCPSS P.E. Instructional Facilitator, Wilde Lake HS and Wilde Lake MS staff, it was decided to provide a 8' wide continuous paved path for students and staff, to remove the second baseball field and to provide areas for two separate practice fields (outlined in green).
- ii Outdoor Classroom design has been refined, see rendering on page 16.
- iii Columbia Pathway Committee has requested that a pathway connection be provided in the future along the east side of the property in addition to restoring the path along the western property line.

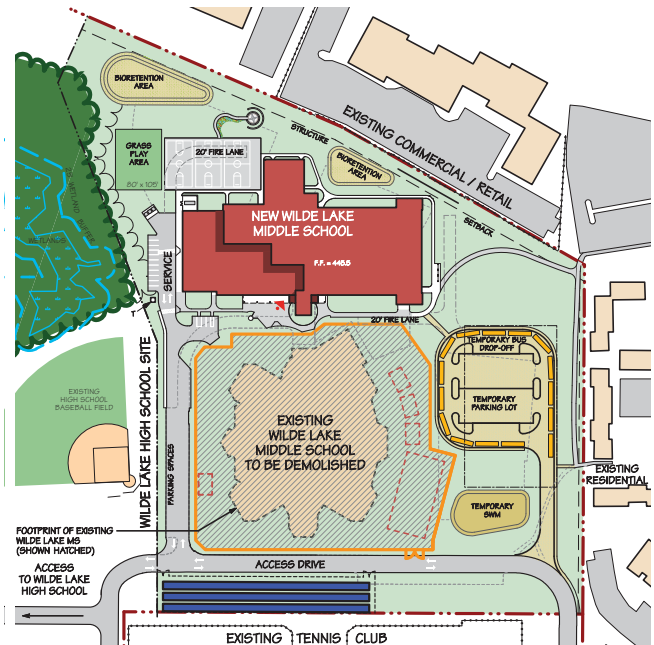
Conceptual Site Phasing Diagrams

(27 month duration)



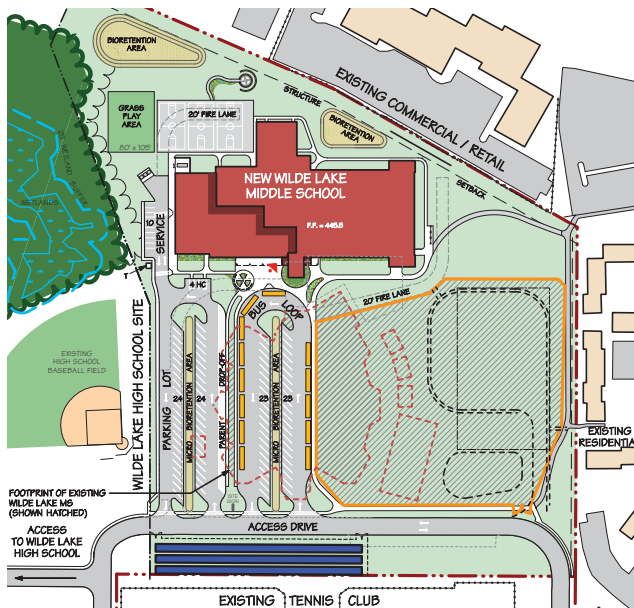
Phase 1

- Relocate existing stormwater piping.
- Provide temporary service area.
- Drill geothermal wells.
- Construct new school.
- Construct temporary bus loop and parking area.
- No playfields during this phase.



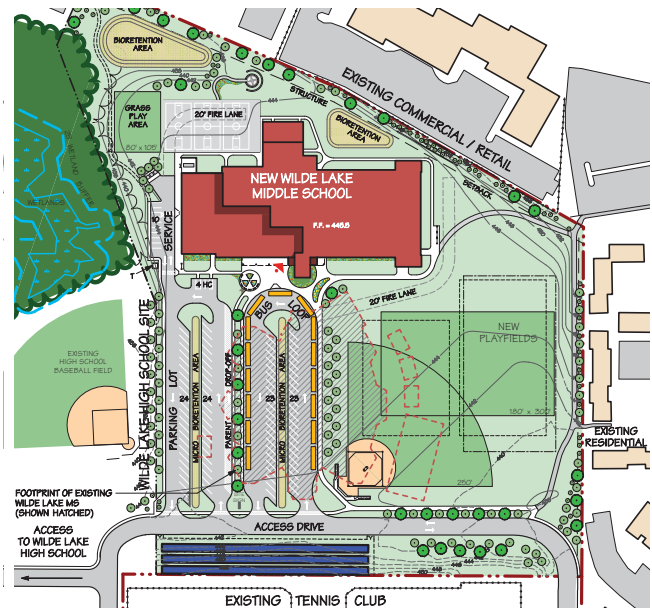
Phase 2

- Demolish existing school.
- Construct new bus loop and parking lot.
- No playfields during this phase.



Phase 3

- Remove temporary bus loop and parking area.
- Install and stabilize new playfields.
- No use of playfields during the phase.



Final Site Plan



View of Outdoor Classroom

Aerial View

FIRST FLOOR PLAN NOTES:

- Support spaces for the locker rooms have been modified after meeting with the P.E. Instructional Facilitator. Towel rooms have been eliminated and doors in the planning rooms have been relocated to provide better visual supervision to locker rooms.
- Built-in dust collection system and dedicated room for this system have been removed. As a result, the storage room has increased in size.
- Area of glazing around the media center has been modified to create wall space for a built-in projector and projection board at two instructional areas.
- Location and extent of sunshades has increased.

First Floor Plan

LEGEND

- = ADMINISTRATIVE SPACES
- = GRADES 6-8
- = SCIENCE LABS
- = SPECIAL EDUCATION
- = CENTRAL SUPPORT SPACES
- = ARTS & TECHNOLOGY
- = BUILDING SERVICES

ABBREVIATIONS

- ALS = Academic Life Skills
- BSAP = Black Student Achievement Program
- CC = Custodial Closet
- CR = Classrooms
- ESOL = English for Speakers of Other Languages
- HP = Heat Pump Room
- IDF = Intermediate Distribution Frame Room
- MDF = Main Distribution Frame Room
- S = Storage Room
- SRO = Student Resource Officer
- T = Toilet Room



Second Floor Plan

SECOND FLOOR PLAN NOTE:

- d. Location and extent of sunshades has increased.



Floor Plan Narrative

The new Wilde Lake Middle School will maintain the following spatial relationships:

Access and Circulation

Entrances

The main entrances are clearly marked for visitors by both their location and by the architectural significance of the projecting main stairwell.

Entrances are arranged to distribute student traffic during arrival and departure times, to meet code egress requirements, and to permit easy access to the gym and cafeteria for after-hours activities. Particular attention has been paid to providing an adequate number of doors in the heavily populated classroom areas for dismissal time.

Corridor Arrangement

A conscious effort was made to develop a corridor pattern which is clear-cut in its arrangement and easy to supervise. Stairs are located at the four corners of the two-story wing. As noted, an elevator is provided very close to the main entrance for the use of handicapped persons and for the easy movement of furniture and equipment.

The main interior stair at the front of the building is next to the main entrances and is immediately adjacent to the administrative area.

Student Lockers are located along corridor walls throughout the classroom areas in lieu of a pod design with concentrated areas of lockers. Lockers are located on just one side of corridors, wherever possible, to minimize congestion.

Student Restrooms are located on both floors near stairways in all three grade level areas and adjacent to the cafeteria and gymnasium entrances. The cafeteria/gymnasium lobby restrooms are also intended to be used during after-hours activities. Teachers' toilets are located on both floors of the classroom wing and adjacent to the staff lounge.

The **administrative area** is central to the building and adjacent to the main entrance with a view of the parent and bus drop-off areas. The **health suite** and **staff lounge** are all directly accessible from this area. Both the health suite and the staff lounge have separate entrances from main corridors. The teachers' mailboxes, which will be in the workroom, can be conveniently serviced from the administrative area. Proximity to the cafeteria was also a consideration in the location of the staff lounge.

The **guidance suite** is located in an easy-to-reach location, convenient to the office area, yet with a distinct identity.

Classrooms are located in the two-story portion of the school and arranged so that each grade level has its own distinct area. Almost all classrooms are located on exterior walls with windows.

Science laboratories have been placed on both levels convenient to all three grade levels. Four of the five labs are adjacent to prep rooms and project/seminar rooms. In addition, one classroom will have a safety shower and cabinetry to support basic science instruction.

Teacher planning rooms, seminar rooms, and storage rooms are distributed throughout the two-story classroom wing.

Floor Plan Narrative (continued)

A **special education suite** is located on the first floor of the classroom wing. This suite includes the speech room, classroom, related services therapy room, handicap accessible toilet, a conference room, planning room, storage room and two resource rooms. The system 44 room has been located on the second floor.

The **media center** is the symbolic, as well as, the actual center of the school. It is located on the first floor in the middle of the classroom area and is visible from the second floor corridors above. Natural daylight from above brightens this dramatic two-story high space and the rooms surrounding it on both floors. The media center can be entered from all three adjacent corridors to encourage student use. The **technology resource room** is entered and monitored from the media center.

The **gifted and talented resource room** has a central location in the second floor classroom area overlooking the media center. The **TV studio** is adjacent to this space, since it is monitored by the G/T teacher.

The **art classroom** and the **health classroom** are located on the first floor, near other related-arts spaces and easily reached from all classroom areas. Both of these rooms are located on an exterior wall with windows.

The **world languages classroom** is placed in the center of the second floor classroom area across the corridor from the **ESOL resource room**.

The **technology education rooms, family and consumer science rooms, and music suite** are located on the first floor away from the quiet two-story classroom wing, yet are easily accessed both during the school day and during after-hours use.

The **gymnasium** is located so that it can be entered from the classroom side of the school or from a lobby which also serves the cafeteria entrance. Direct access has been provided from the gym to the outdoor paved play area and a grass play area. The gym and the adjoining **fitness lab/activity room** are located for easy, but controlled, access during after-hours activities. Locker rooms are designed to be entered from inside the gymnasium for visual control by physical education teachers and are provided with access directly to the outside.

The **cafeteria** is located for easy access by after-hours users and in close proximity to the music rooms for use of the stage. For after-lunch recess, there is direct access to the outdoor paved play area and there is convenient access to the gymnasium and restrooms. Large windows are provided to ensure visibility from the cafeteria to the paved play area during lunch time supervision. Kitchen serving lines are entered from inside the cafeteria and there is convenient access to the service area for trash removal. An operable wall has been provided at the front of the **stage** to permit use of this area as a teaching station during lunch periods. A ramp has been provided for handicap access to the stage.

The **kitchen** has a full-preparation arrangement and is convenient to the service area for deliveries and trash removal.

The **custodial areas** are placed on a main corridor near the service entrance and adjacent to the mechanical and electrical rooms. Custodial closets are distributed throughout the school and placed next to restrooms for plumbing economy.

The **service area** has direct corridor access to the center of the school, allowing for convenient deliveries and trash removal.

Architectural Character

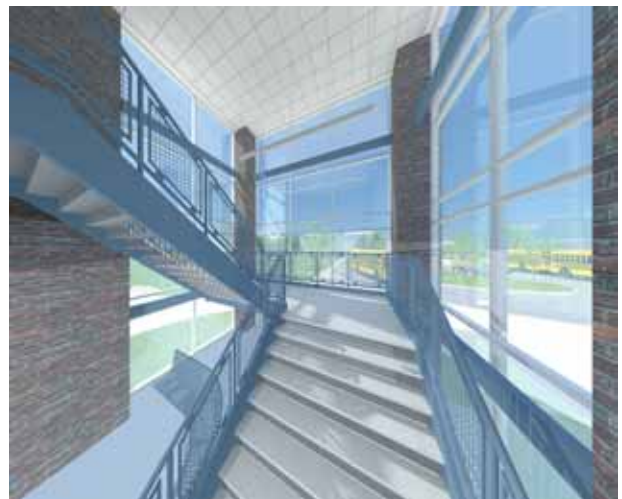


Just as the exterior facade for the prototype middle school (Thomas Viaduct Middle School) was entirely redesigned to reflect the traditional design aesthetic of the Oxford Square community, the facade of the new Wilde Lake Middle School has been redesigned due to the need for a highly insulated building envelope which, secondarily, will help distinguish this building from the other prototype middle schools.

The facade will incorporate super-insulated masonry walls on the first floor where greater durability is required and highly insulated metal wall panels on the second floor with masonry on the interior face.

Exterior masonry unit sizes will recall those used on the adjacent Wilde Lake High School. Double-glazed, thermally broken aluminum windows will allow daylight into the building while resisting thermal temperature differences between the interior and exterior. Exterior windows on the east, south and west-facing facades will have exterior sunshades to shield the interior from the high, hot summer sun, while allowing the low winter sun to penetrate the interior during the heating season.

As seen in the image to the right, the main entrance 'stair tower' will be flooded with diffused northern daylight. A wall of glass will provide exterior views from the main office and lobby and the new stair design will be open below the landing.



Exterior Elevations



Choral Room

Tech Ed

Family and
Consumer Sciences

Administrative
Suite

Main
Entrance

Guidance
Suite

Two-Story
Academic Wing

Stair

Front Elevation (North - Facing)



Paved Play Area
Locker Rooms Beyond

Outdoor Equipment
Enclosure

Electrical
Room

Mechanical
Room

Entrance

Band
Room

Choral
Room

Parking Lot
Bus Loop Beyond

Side Elevation (East - Facing)

Exterior Elevations



Stair Two-Story Academic Wing Stair Locker Rooms
Gymnasium Beyond Cafeteria Kitchen Paved Play Area

Rear Elevation (South - Facing)



Playfields Main Entrance
Beyond Stair Science Classrooms Stair

Side Elevation (West - Facing)

Space Analysis

	Exist. Wilde Lake		New Wilde Lake Middle School					
	Middle School		SD Phase		DD Phase		CD Phase	
	Area(s)	Total Net	Area(s)	Total Net	Area(s)	Total Net	Area(s)	Total Net
Administration		2,224		2,993		3,120		3,106
Principal's Office (incl. toilet)	1	237	1	247	1	251	1	247
Assistant Principal's Office	1	220	1	176	1	183	1	181
Conference Room	1	215	1	189	1	187	1	183
Workroom/Mailroom (incl. storage)	2	294	1	574	1	569	1	569
Reception Area/Secretarial	1	316	1	533	1	573	1	572
Staff Dining	1	497	1	411	1	505	1	504
Principal's Secretary	1	119	1	102	1	104	1	106
Toilet	5	191	7	358	7	354	7	354
Security Office (SRO) *	1	135	1	98	1	108	1	108
Administrative Intern *	0	0	1	100	1	103	1	103
Volunteer/Community Room **	0	0	1	139	1	121	1	118
School Store **	0	0	1	66	1	62	1	61
Art		942		1,546		1,523		1,522
Studio	1	874	1	1,294	1	1,270	1	1,269
Kiln Room	1	68	1	106	1	107	1	107
Storage **	0	0	1	146	1	146	1	146
Cafeteria / Food Service		5,326		7,097		7,188		7,142
Kitchen Area	1	1,514	1	2,050	1	2,050	1	2,048
Dry Storage Area	1	166	1	161	1	159	1	159
Office	1	63	1	59	1	57	1	57
Student Dining	1	2,800	1	3,509	1	3,569	1	3,571
Stage	1	631	1	912	1	925	1	925
Stage Storage	1	152	2	176	2	190	2	122
Stage Ramp **	0	0	1	230	1	238	1	260
Computer Lab		406		779		771		771
Computer Lab	1	406	1	779	1	771	1	771
Building Services		1,951		6,963		7,973		7,993
Can Wash	1	105	1	63	1	64	1	64
Decentralized Custodial Closets	3	290	3	226	3	316	3	311
General School Storage	1	276	1	127	0	0	0	0
Outside Equipment Storage	2	245	1	169	1	200	1	200
Toilet w/ shower	1	33	1	66	1	67	1	70
Electrical	4	478	3	552	3	549	3	549
Mechanical (incl. Heat Pump Rooms & Geothermal)	1	440	28	5,177	26	6,208	26	6,229
Main Distribution Frame (MDF) Room	1	84	1	247	1	254	1	254
Telecommunications (IDF)**	0	0	2	102	2	80	2	80
Kitchen Wash Room **	0	0	1	52	1	52	1	52
Custodial Office (incl. Storage)**	0	0	1	182	1	183	1	184
General Academic Areas		14,874		16,383		17,635		17,599
Classrooms	15 *	11,920	17	13,229	19	14,531	19	14,504
Storage Area	6	454	2	369	2	389	2	389
Teacher Planning Room	1	267	2	1,673	2	1,626	2	1,626
Seminar Room	5 **	2,233	3	1,112	3	1,089	3	1,080

* (does not include 1 classroom located in portable classroom)

** (includes existing CRs below 660sf)

Space Analysis (continued)

	Exist. Wilde Lake Middle School		New Wilde Lake Middle School					
	Area(s) Total Net		SD Phase Area(s) Total Net		DD Phase Area(s) Total Net		CD Phase Area(s) Total Net	
Gifted & Talented Resource Room		474		1,016		1,030		1,020
GT Resource Room	1	274	1	768	1	785	1	775
TV Studio	1	144	1	194	2	190	1	190
Planning Storage Room	1	56	1	54	1	55	1	55
Guidance		837		1,363		1,350		1,350
Secretarial/Reception (incl. closet)	1	195	1	369	1	343	1	345
Counseling Offices	2	372	2	282	2	280	2	280
Record Storage	2	136	1	172	1	228	1	228
Data Clerk *	1	134	1	144	1	97	1	95
Conference Room **	0	0	1	259	1	267	1	267
Pupil Services Office **	0	0	1	137	1	135	1	135
Health Education		0		781		780		778
Classroom ***	0	0	1	781	1	780	1	778
Health Suite		264		817		838		838
Waiting	1	52	1	200	1	216	1	216
Treatment	1	64	1	92	1	95	1	95
Office	1	50	1	98	1	88	1	88
Rest Area	1	56	2	182	2	180	2	180
Toilets	1	42	2	113	2	128	2	128
Exam **	0	0	1	99	1	95	1	95
Storage **	0	0	1	33	1	36	1	36
Family and Consumer Science		815		1,693		1,752		1,742
Classroom	1	815	2	1,638	1	1,682	1	1,672
Storage **	0	0	1	55	1	70	1	70
Media Center		3,411		4,259		4,207		4,206
Main Reading Room	1	2,683	1	3,268	1	3,238	1	3,235
Technology Resource Room	1	225	1	476	1	455	1	455
Office/Work Space	1	84	1	126	1	127	1	127
Media Production	1	364	1	137	1	137	1	137
Storage Area	2	55	1	252	1	250	1	252
Music		2,135		3,389		3,720		3,713
Choral Room	1	876	1	989	1	976	1	972
Instrumental Room	1	851	1	1,387	1	1,405	1	1,405
Instrument Storage	1	171	1	200	1	161	1	158
Materials/Repair	1	80	1	95	1	73	1	73
Teacher Planning	1	157	1	157	1	235	1	235
Ensemble Room ***	0	0	1	372	1	691	1	691
Practice Rooms **	0	0	3	189	3	179	1	179
Physical Education		8,431		8,880		8,982		8,997
Gymnasium	1	6,421	1	5,555	1	5,598	1	5,613
Shower Area	2	420	2	202	2	97	2	108
Lockers (incl. toilets)	2	1,276	2	1,395	2	1,425	2	1,425
Storage (Large Equipment)	1	146	1	308	1	324	1	324
Storage (Towel)	2	30	2	120	1	65	0	0
Office/Shower/Toilet	2	138	2	268	2	319	2	327
Laundry **	0	0	1	114	1	180	1	228
Storage (Small Equipment) **	0	0	1	127	1	135	1	135
Fitness Lab/Activity Room (incl. storage) **	0	0	1	791	1	839	1	837

Space Analysis (continued)

	Exist. Wilde Lake Middle School		New Wilde Lake Middle School			
	Area(s)	Total Net	SD Phase Area(s)	Total Net	DD Phase Area(s) Total Net	CD Phase Area(s) Total Net
Science		4,895		6,279		6,328
Science Laboratories	5	4,308	5	5,579	5	5,572
Preparation Room	1	261	2	272	2	295
Storage Room	3	326	2	170	2	169
Project/Seminar Room **	0	0	2	258	2	292
Special Education		1,323		2,872		2,987
Conference Room	1	180	1	152	1	154
Teacher Planning Room *	2	536	1	255	1	246
Speech *	1	267	1	304	1	299
ALS Classroom (including storage) *	1	340	1	535	1	529
Related Services Therapy Area (incl. storage) **	0	0	1	352	1	354
Classrooms **	0	0	3	1,085	3	1,064
Storage **	0	0	1	97	1	89
ADA Toilet **	0	0	1	92	1	101
Student Support Spaces		455		451		436
BSAP (Academic Mentor Office) *	1	120	1	139	1	118
Alternative Education (Contract Room) *	1	335	1	312	1	318
Technology Education		2,212		2,732		2,468
Production Lab	1	1,462	1	1,014	1	927
Tech Laboratory	1	591	1	1,220	1	1,070
Resource	1	159	1	98	1	96
Dust Room **	0	0	1	99	1	93
Storage Rooms **	0	0	2	301	2	288
Toilet Rooms		1,096		1,313		1,346
Public Toilets (Men & Women)	4	1,096	4	1,313	4	1,296
Unisex Toilet **	0	0	0	0	1	50
World Language		166		1,227		1,140
ESOL *	1	166	1	420	1	405
Classroom (incl. storage) ***	0	0	1	807	1	735

Space Analysis Summary

	Exist. Wilde Lake Middle School	New Wilde Lake Middle School		
		SD Phase	DD Phase	CD Phase
Total Net Sq. Ft.	51,235	66,755	68,517	68,220
Mech/Elec Spaces	1,002	6,078	7,091	7,112
Walls, Circulation, Structure, Shafts, etc	18,293	30,195	30,613	30,889
Gross Area Total	70,530	103,028	106,221	106,221

* Existing program at WLMS

** New space at WLMS

*** Currently located in portable classroom

Construction Cost Estimate

The new Wilde Lake Middle School

	Schematic Phase	DD Phase	CD Phase
Site Work (includes demolition of existing building)	\$ 5,250,944	\$ 5,957,680	\$ 5,299,130
Building (includes solar PV system)	\$ 25,747,802	\$ 28,889,176	\$ 28,008,721
Construction Cost Total	\$ 30,998,746	\$ 34,846,856	\$ 33,307,851
Less Net Zero School Program grant from MEA	(-\$ 2,200,000)	(-\$ 2,240,000) *	(-\$ 2,240,000)
Total for Project	\$ 28,798,746	\$ 32,606,856	\$ 31,067,851

* Dollar amount was adjusted during the design development phase to reflect the actual amount documented in the Net Zero Schools Program Grant Implementation Agreement between HCPSS and MEA.

Notes

- Construction cost estimate was prepared by the construction manager, Oak Contracting, and assumes that bids will be received in March 2015.
- Estimate includes cost of food service equipment.
- Estimate includes a construction document phase cost estimate contingency of +2 percent.
- Estimate assumes wage rate pricing per Maryland House Bill 727 entitled "Procurement - Prevailing Wage- Applicability" which took effect July 1, 2014. Wage rates are based on prevailing wage scale guidelines for the geographical area of this project at this time.
- Estimate does not include a project contingency.
- Estimate does not include costs associated with the relocation of any portable classrooms shown on site.