ACTION

HOWARD COUNTY
PUBLIC SCHOOL SYSTEM

BOARD OF EDUCATION OF HOWARD COUNTY
MEETING AGENDA ITEM

TITLE: Swansfield Elementary School Construction Documents Report **DATE:** November 19, 2015

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

Gretchen Wagner, Project Manager, GWWO Inc./Architects

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

OVERVIEW:
The attached construction documents brochure describes in detail the general scope of work for Swansfield Elementary School. The project encompasses two phases. The first phase will address the capacity expansion needs with two additions to the school, eliminating the need for the existing relocatable portables. The first phase additions will also house the related arts areas, create a secured vestibule, as well as renovate the existing space to provide a COMAR compliant health suite, pre-kindergarten classroom, and toilet rooms. The second phase will include extensive renovations to the existing building, both programmatic and systemic; this includes the conversion of existing open pod areas into self-contained classrooms, as well as new mechanical, electrical, and technology systems.

There have only been minor refinements since the design development. The majority of the work in this phase has involved the development and final coordination of the building systems, construction phasing, and interior details. Some of the updates that have taken place include, relocation of the playground equipment for grades 1-5 and an increase of hardscape play area; reduction of the mechanical room size to accommodate an additional custodial space; and addition of corridor doors adjacent to the gymnasium for afterhours security. A traffic study was also conducted as requested to examine transportation concerns.

It is the intent of the design to achieve a Leadership in Energy and Environmental Design (LEED) "Certified" designation.

RECOMMENDATION/FUTURE DIRECTION:
It is recommended that the construction documents report for Swansfield Elementary School be approved as submitted.

SUBMITTED BY:
Scott W. Washington, Director
School Construction

APPROVAL/CONCURRENCE:
Renee A. Foose, Ed.D.
Superintendent

Camille B. Jones
Chief Operating Officer

Bruce Gist
Executive Director
Facilities, Planning and Mgmt.

ADDITIONS AND RENOVATIONS TO SWANSFIELD ELEMENTARY SCHOOL

Construction Documents Submission | November 19, 2015

HOWARD COUNTY PUBLIC SCHOOL SYSTEM

GWWO

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ADDITIONS AND RENOVATIONS TO
SWANSFIELD ELEMENTARY SCHOOL

CONSTRUCTION DOCUMENTS SUBMISSION
NOVEMBER 19, 2015

FOR THE BOARD OF EDUCATION OF HOWARD COUNTY:

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PLANNING ADVISORY COMMITTEE

Molly Ketterer	Principal, Swansfield Elementary School
Heather Moraff	Assistant Principal, Swansfield Elementary School
Ferne Kroeker	Special Educator, Swansfield Elementary School
Stephany Warner	Primary Teacher, Swansfield Elementary School
Patricia Borowski	Day Chief Custodian, Swansfield Elementary School
Charles E. Young	Night Custodial Supervisor, Swansfield Elementary School
Suzanne Kuttas	Para-Educator, Swansfield Elementary School
Kathy Eckley	Physical Education Teacher, Swansfield Elementary School
Jackie Lujan	Title I Teacher, Swansfield Elementary School
Audrey Salazar	Fifth Grade Teacher, Swansfield Elementary School
Carolyn Toland	Principals Secretary, Swansfield Elementary School
Rhonda Lewis	Parent, Swansfield Elementary School
Annette Varoli	PTA Vice President, Swansfield Elementary School
Ron Morris	Administrative Director, HCPSS
Scott Washington	Director, School Construction, HCPSS
Dan Keiser	Program Manager, School Construction, HCPSS
Dan Lubeley	Manager of Design & Pre-Construction, School Construction, HCPSS
Betsy Zentz	Construction Interagency Specialist, HCPSS
Reny Toledo	AV & Network Support, HCPSS
David Shaw	Manager, Network Operations, HCPSS
Ron Miller	Manager, Safety, Environment and Risk Management, HCPSS
Frank Eastham	Executive Director, School Improvement & Administration, HCPSS
Gloria Mikolajczyk	School Facilities, Architect Supervisor, MSDE
Dan Hagan	Construction Manager, J. Vinton Schafer & Sons, Inc.
Paul Hume	Principal, GWWO Inc/Architects
Gretchen Wagner	Project Manager, GWWO Inc/Architects
Taylor Metcalf	Intern Architect, GWWO Inc/Architects

DESIGN TEAM

ARCHITECT	GWWO, Inc./Architects	Baltimore, MD
CIVIL ENGINEER	Fisher, Collins & Carter, Inc.	Ellicott City, MD
STRUCTURAL ENGINEER	Columbia Engineering, Inc.	Columbia, MD
MEP ENGINEER	James Posey Associates	Baltimore, MD
ACOUSTICAL CONSULTANT	Acoustical Design Collaborative, Ltd.	Ruxton, MD

DESIGN DEVELOPMENT PHASE PARTICIPANTS

Molly Ketterer	Principal, Swansfield Elementary School
Heather Moraff	Assistant Principal, Swansfield Elementary School
Carolyn Toland	Principals Secretary, Swansfield Elementary School
Marcia Tallman	Front Office, Swansfield Elementary School
Uyuosa Osahon	Front Office, Swansfield Elementary School
Tracey Ellerby	Health Suite, Swansfield Elementary School
Kelly Tabar	Health Suite, Swansfield Elementary School
Alesia Richter	Guidance Counselor, Swansfield Elementary School
Karen Rakshys	School Psychologist, Swansfield Elementary School
Jessica Hummel	Reading Recovery Teacher, Swansfield Elementary School
Rosa Maria Gamble	Hispanic Achievement Liaison, Swansfield Elementary School
Ferne Kroeker	Special Educator, Swansfield Elementary School
Rebecca Beall	Special Educator, Swansfield Elementary School
Suzanne Kuttas	Para-Educator, Swansfield Elementary School
Lisa Day	Pre-Kindergarten Teacher, Swansfield Elementary School
Crystal Shipley	Kindergarten Teacher, Swansfield Elementary School
Debbie Niezgoda	Kindergarten Teacher, Swansfield Elementary School
Stephany Warner	Primary Teacher, Swansfield Elementary School
Audrey Salazar	Intermediate Teacher, Swansfield Elementary School
Kathy Eckley	Physical Education Teacher, Swansfield Elementary School
Nelson Dennis	Physical Education Teacher, Swansfield Elementary School
Kym Nwosu	Resource Teacher, Swansfield Elementary School
Jackie Lujan	Title I Teacher, Swansfield Elementary School
Tim Wilson	Technology Teacher, Swansfield Elementary School
Mike Glennon	Technology Teacher, Swansfield Elementary School
Janice Ford	Art Teacher, Swansfield Elementary School
Peggy Greenman	Music Teacher, Swansfield Elementary School
Kathleen Smith	Media Specialist, Swansfield Elementary School
Patricia Borowski	Day Chief Custodian, Swansfield Elementary School
Charles E. Young	Night Custodial Supervisor, Swansfield Elementary School
Elijah Sow	Student, Swansfield Elementary School
Nathaniel Usman	Student, Swansfield Elementary School
Samya Miles	Student, Swansfield Elementary School
Ali Usman	Student, Swansfield Elementary School
Devon McGuiness	Student, Swansfield Elementary School
McKenzie Lawings	Student, Swansfield Elementary School
Amy Ingram	Student, Swansfield Elementary School
Dan Lubeley	Manager of Design & Pre-Construction, School Construction, HCPSS
Gretchen Wagner	Project Manager, GWWO Inc/Architects
Taylor Metcalf	Intern Architect, GWWO Inc/Architects

PROJECT DESCRIPTION

Swansfield Elementary School is a 64,819 square foot, one-story structure serving pre-kindergarten through fifth grade. The original school was constructed in 1972 with additions in 1988 and 2008, as well as a renovation in 1996. The school is organized in a classroom pod configuration. Each pod was once an open classroom area. As the school evolved, gypsum board partitions and other temporary partitions were added to separate the classrooms. Currently, each grade level has four to five classrooms and a commons/circulation space. Grades four and five also have smaller extended learning rooms that are being used as overflow space for other programs in the building. There are also four portables on the site that house two gifted and talented classrooms, a technology lab, and a band and strings classroom.

The school currently has a state rated capacity of 601 and an enrollment of 590 for the 2014/2015 school year. It is projected that there will be a need to accommodate an additional 100 students post-renovation. A complete renovation and addition of the school is being planned with systemic upgrades in compliance with the Howard County Public Schools System's (HCPSS) "Guidelines Manual for Renovations and Modernizations of Existing Schools."

Two additions are being proposed for the school:

- The first addition is an administration addition which would house offices and a conference room and would be constructed adjacent to the main entrance to provide a secure entrance vestibule.
- The second is a classroom addition which would house a new classroom pod consisting of four classrooms and an extended learning room, two music classrooms, two art classrooms, and other additional storage and office spaces.

Other program renovation goals proposed:

- The health suite will be relocated and enlarged to meet Code of Maryland Regulations (COMAR) standards.
- Existing classrooms will be addressed through interior modifications to improve size, daylight and acoustics.
- The cafeteria will be enlarged to accommodate the additional 100 students.

The renovation work at Swansfield Elementary School will also include new windows, new doors and hardware, the addition of insulation for existing exterior walls, a new roof over the 1988 addition, new ceiling systems, new lighting and electrical systems, a new sprinkler system, and new mechanical systems and plumbing upgrades. Upon completion of the project, the school will be in compliance with handicapped accessibility requirements.

Swansfield Elementary School will be designed to meet a LEED (Leadership in Energy and Environmental Design) 'Certified' level of certification. The project will be registered under the LEED for Schools v3 (LEED-S) rating system.

PROJECT AREA

	SD PHASE	DD PHASE	CD PHASE
Existing Building	64,819 SF	64,819 SF	64,819 SF
Administration Addition	1,120 SF	1,138 SF	1,138 SF
Classroom Addition	13,839 SF	15,025 SF	15,025 SF
TOTAL:	**79,778 SF**	**80,982 SF**	**80,982 SF**

PROJECT SCHEDULE

Planning Advisory Committee Meetings Completed	FEBRUARY 3, 2015
Schematic Design submitted to Board of Education	FEBRUARY 26, 2015
Design Development submitted to Board of Education	JUNE 25, 2015
Construction Documents submitted to Board of Education	NOVEMBER 19, 2015
Project out for Bids	JANUARY 2016
Bids Received	FEBRUARY 2016
Construction Start	MAY 2016
Construction Final Completion	DECEMBER 2017

DESIGN PROCESS

The schematic design report for Swansfield Elementary School was presented to the Board of Education for approval on February 26, 2015. The project was approved by the Board and was subsequently submitted to the state Interagency Committee for School Construction. The state then reviewed and approved the project to proceed into the design development phase.

The design has undergone some refinements based on the design development meetings held with the faculty and staff of Swansfield Elementary School. During this process, department representatives reviewed the design of the new additions and renovated areas and suggested revisions to the layout of the teaching and office spaces. These collaborative meetings facilitated discussion and allowed the design team to address many of the concerns that current staff members are experiencing in the existing building.

The design development meetings addressed the following items:

- An overview of the process for the HCPSS renovations and additions.
- A review of the proposed classroom pods and modifications provided for the spaces to function more effectively for teachers and students.
- A review of proposed new additions and space adjacencies.
- A detailed review of furnishing layouts for administrative and educational spaces.

The design development submission reflects the consensus of the discussion among the Swansfield Elementary School staff, HCPSS purchasing department and the design team to provide the most responsive layout to achieve the needs of the school and its students.

CONTINUATION OF THE DESIGN PROCESS

The design development report for Swansfield Elementary School was presented to the Board of Education for approval on June 25, 2015. The project was approved by the Board and was subsequently submitted to the state Interagency Committee for School Construction. The state then reviewed and approved the project to proceed into the construction documents phase.

There have only been minor refinements to the proposed site and floor plans in the construction documents phase. The majority of the work performed in this phase involved coordinating the mechanical, electrical, and structural elements necessary to produce the bid documents for the project. In addition, there was further development of the construction phasing and egress plans, finish selections, interior details, and building envelope design.

A number of coordination meetings have taken place between the design team, construction manager and the HCPSS staff. In addition, the following meetings were also conducted during the construction documents phase:

- A meeting with HCPSS facilities representatives to discuss hardware, carpentry, roofing, electrical, IT and mechanical systems.
- A meeting with the Howard County Fire Marshal to review egress plans for the multiple phases of construction.

Based on suggestions from the presentation of the design development report to the Board of Education, a traffic study was perfomed to evaluate the arrival and dismissal times at the school.

The civil drawings were also submitted to Howard County for the grading permit application on September 4, 2015.

SUSTAINABLE DESIGN GOALS

The United States Green Building Council (USGBC) established the LEED program as a tool to evaluate the energy efficiency and environmental impacts of building projects. The LEED building rating system uses six categories in which projects can obtain credits to achieve certification: Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources, Indoor Environmental Quality, and Innovation and Design. The four levels of certification are Platinum, Gold, Silver, and Certified. The number of credits required is dependent on the level of certification that the project is seeking to attain.

After discussions with the design team and the HCPSS, it was determined that Swansfield Elementary School will be pursuing LEED certification at the Certified level. The project is registered under the LEED for Schools v3 (LEED-S) rating system. The current tally identifies 50 credits, with 14 additional possible credits. This total allows for a comfortable margin for achieving the targeted certification level for the building with the possibility of attaining a Silver certification. Below is a brief description of some of the credits that are being pursued with a full LEED scorecard on the following pages.

Sustainable Sites:

- The project is located within close proximity to public transportation. Dedicated walk and bike paths and bike racks will be provided, as well as preferred parking for low emitting vehicles.

Water Efficiency:

- The project is targeting water savings of 30 percent through the replacement of plumbing fixtures throughout the building with water efficient fixtures.

Energy & Atmosphere:

- The project proposes replacement of existing systems with a HVAC designed for greater energy efficiency.
- The project will pursue fundamental and enhanced commissioning.

Materials & Resources:

- The project will pursue building reuse by maintaining 75 percent of the exterior walls, roof structure, floor structure and interior bearing walls and columns.
- The project will pursue construction waste management by recycling and diverting 75 percent of the construction waste from the landfill.

Indoor Environmental Quality:

- The project will install low-emitting paints, adhesives, sealants, and carpet.
- The project will pursue daylighting of 75 percent of the classroom spaces.

Innovation in Design:

- The project will pursue using the school as a teaching tool to enhance the curriculum through environmental education.

LEED SCORECARD

Y	?	N			
18	1	5	**Sustainable Sites**	Possible Points:	**24**
Y			Prereq 1	Construction Activity Pollution Prevention	
Y			Prereq 2	Environmental Site Assessment	
1			Credit 1	Site Selection	1
4			Credit 2	Development Density and Community Connectivity	4
		1	Credit 3	Brownfield Redevelopment	1
4			Credit 4.1	Alternative Transportation—Public Transportation Access	4
1			Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
2			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	2
2			Credit 4.4	Alternative Transportation—Parking Capacity	2
		1	Credit 5.1	Site Development—Protect or Restore Habitat	1
1			Credit 5.2	Site Development—Maximize Open Space	1
		1	Credit 6.1	Stormwater Design—Quantity Control	1
1			Credit 6.2	Stormwater Design—Quality Control	1
		1	Credit 7.1	Heat Island Effect—Non-roof	1
	1		Credit 7.2	Heat Island Effect—Roof	1
1			Credit 8	Light Pollution Reduction	1
		1	Credit 9	Site Master Plan	1
1			Credit 10	Joint Use of Facilities	1

3	5	3	**Water Efficiency**	Possible Points:	**11**
Y			Prereq 1	Water Use Reduction—20% Reduction	
	4		Credit 1	Water Efficient Landscaping	2 to 4
		2	Credit 2	Innovative Wastewater Technologies	2
3	1		Credit 3	Water Use Reduction	2 to 4
		1	Credit 3	Process Water Use Reduction	1

8	3	22	**Energy and Atmosphere**	Possible Points:	**33**
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
5	2	12	Credit 1	Optimize Energy Performance	1 to 19
		7	Credit 2	On-Site Renewable Energy	1 to 7
2			Credit 3	Enhanced Commissioning	2
	1		Credit 4	Enhanced Refrigerant Management	1
1		1	Credit 5	Measurement and Verification	2
		2	Credit 6	Green Power	2

6	2	5	**Materials and Resources**	Possible Points:	**13**
Y			Prereq 1	Storage and Collection of Recyclables	
1	1		Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 2
		1	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
2			Credit 2	Construction Waste Management	1 to 2

Materials and Resources, Continued

Y	?	N			
		2	Credit 3	Materials Reuse	1 to 2
2			Credit 4	Recycled Content	1 to 2
1	1		Credit 5	Regional Materials	1 to 2
		1	Credit 6	Rapidly Renewable Materials	1
		1	Credit 7	Certified Wood	1

9 | 1 | 9 Indoor Environmental Quality — Possible Points: 19

Y		Prereq 1	Minimum Indoor Air Quality Performance	
Y		Prereq 2	Environmental Tobacco Smoke (ETS) Control	
Y		Prereq 3	Minimum Acoustical Performance	
	1	Credit 1	Outdoor Air Delivery Monitoring	1
	1	Credit 2	Increased Ventilation	1
1		Credit 3.1	Construction IAQ Management Plan—During Construction	1
1		Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
4		Credit 4	Low-Emitting Materials	1 to 4
1		Credit 5	Indoor Chemical and Pollutant Source Control	1
1		Credit 6.1	Controllability of Systems—Lighting	1
1		Credit 6.2	Controllability of Systems—Thermal Comfort	1
	1	Credit 7.1	Thermal Comfort—Design	1
	1	Credit 7.2	Thermal Comfort—Verification	1
1	2	Credit 8.1	Daylight and Views—Daylight	1 to 3
	1	Credit 8.2	Daylight and Views—Views	1
	1	Credit 9	Enhanced Acoustical Performance	1
	1	Credit 10	Mold Prevention	1

4 | 2 | Innovation and Design Process — Possible Points: 6

1		Credit 1.1	Innovation in Design: Green Housekeeping	1
1		Credit 1.2	Innovation in Design: Exemplary Performance SSc.4.1	1
1		Credit 1.3	Innovation in Design: Exemplary Performance MRc2 - 95%	1
1		Credit 1.4	Innovation in Design: Pilot - Social Equity on Project Team	1
1		Credit 2	LEED Accredited Professional	1
1		Credit 3	The School as a Teaching Tool	1

2 | 2 Regional Priority Credits — Possible Points: 4

1		Credit 1.1	Regional Priority: SSc4.1	1
	1	Credit 1.2	Regional Priority: SSc5.1	1
1		Credit 1.3	Regional Priority: SSc6.2	1
	1	Credit 1.4	Regional Priority: EAc1: Threshold 36% Existing	1

50 | 14 | 46 Total — Possible Points: 110

Certified 40 to 49 points | Silver 50 to 59 points | Gold 60 to 79 points | Platinum 80 to 110

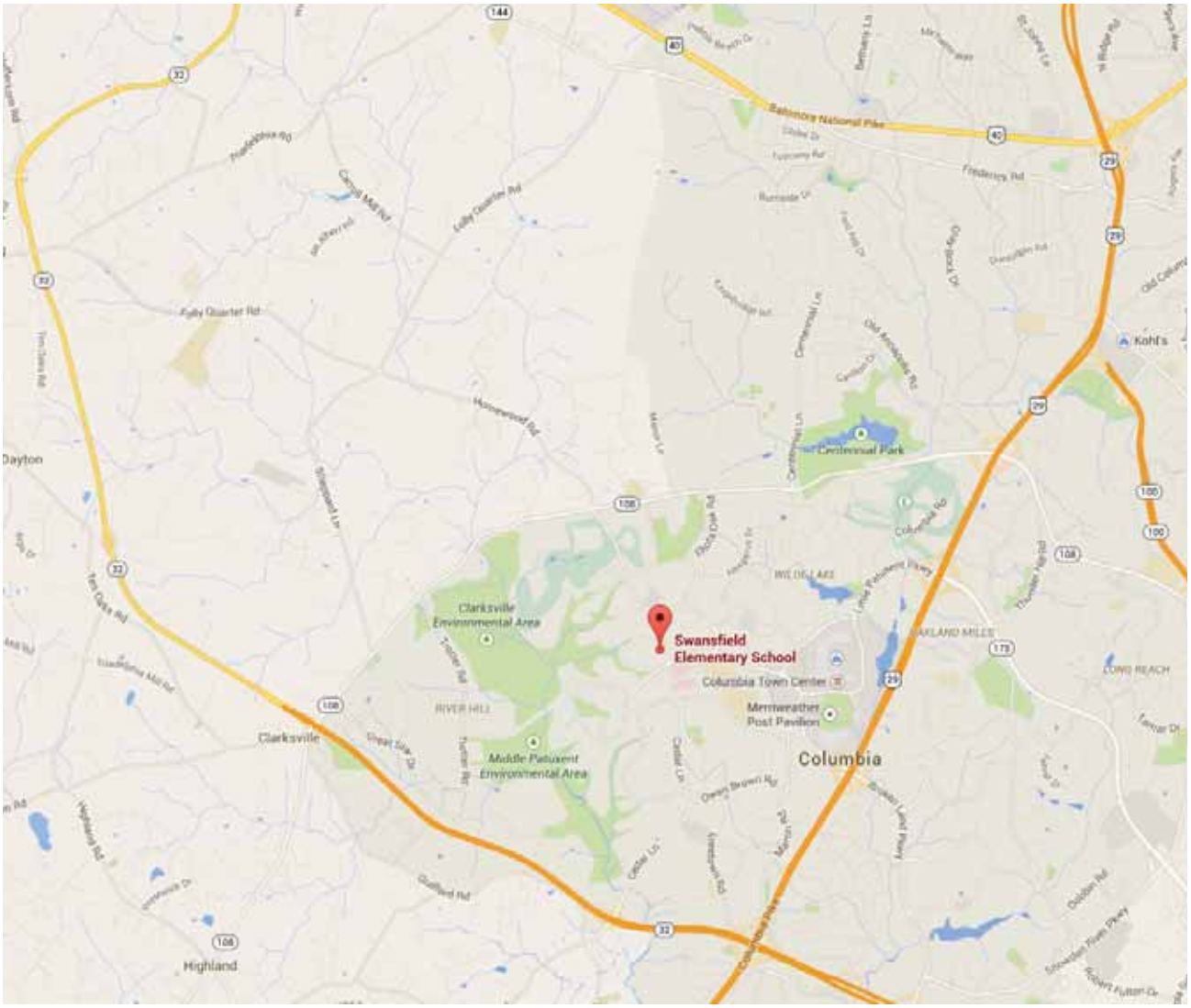
SITE DESIGN NARRATIVE

Swansfield Elementary School is located at 5610 Cedar Lane in Columbia, Maryland. The site is approximately 10 acres. The current site layout allows for the separation of the bus loop and the student drop-off. The bus loop and staff and visitor parking are located on the east side of the building directly adjacent to Cedar Lane. The bus loop accommodates nine buses making it sufficient for the seven buses that currently serve the school. There are 52 parking spaces in the bus loop lot and an additional 43 spaces in the adjacent overflow lot. The student drop-off is located on the north side of the building adjacent to Rock Coast Road and has eight visitor parking spaces.

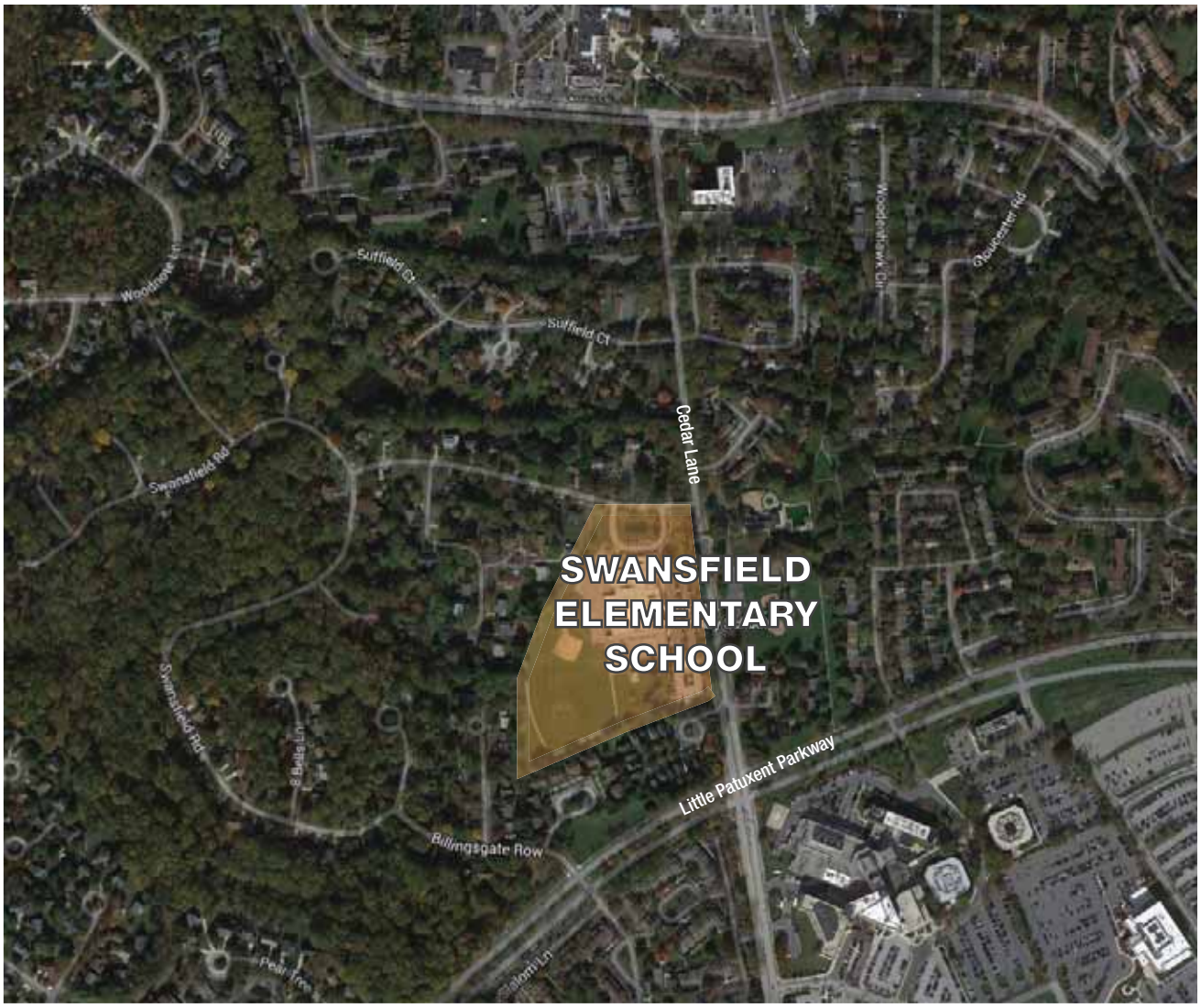
There are currently two playground areas, a large hard play area, a multipurpose field, a baseball field, and a quarter mile long walking path located on the site. There are also designated green initiative trees located on the south side of the site.

Proposed upgrades to the site will include: new paving for the bus loop and associated parking, addition of eight new parking spaces, new curb and gutter at the bus loop, new sidewalks at the student drop-off, relocation of the hard play area, relocation of the grades one through three play area, new lanes for fire department access around the building, and the enlargement of the existing stormwater management facility.

VICINITY MAP



AERIAL SITE PHOTO



EXISTING SITE PLAN

* The following items are designated with numbers in circles on the site plan on the following page.

1. 1972 original building.
2. 1988 Addition: Two classroom pods, gymnasium, and various academic support spaces.
3. 2008 Addition: Pre-kindergarten and two kindergarten classrooms.
4. Bus loop and parking: 52 parking spaces.
5. Additional overflow parking: 43 parking spaces.
6. Student drop-off: eight visitor parking spaces.
7. Kindergarten play area.
8. Grades one through three play area.
9. Hard play area.
10. Baseball field.
11. Multipurpose field.
12. Walking path.
13. Service area.
14. Generator and transformer enclosure.
15. Exterior storage units.
16. Portable classrooms.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16
16
ROCK COAST ROAD
CEDAR LANE

EXISTING FLOOR PLAN

* The following items are designated with numbers in circles on the site plan on the following page.

1. Administration: Undersized and not located adjacent to main entrance.
2. Health suite: Undersized and does not meet COMAR.
3. Student restrooms: Do not meet the Americans with Disabilities Act (ADA) accessibility standards.
4. Art room: Undersized.
5. General music: Undersized.
6. Band & strings: Located in portable.
7. Gifted & talented: Located in portables.
8. Technology lab: Located in portable.
9. Special education office: Only accessible through another classroom.
10. Classrooms: Under 660 square feet and do not qualify as teaching stations.
11. Classroom pods: Do not have enclosed extended learning rooms.
12. Gym storage: Undersized.


ADMINISTRATION
HEALTH / GUIDANCE / PSYCHOLOGY
DINING
ACADEMIC CLASSROOMS
ACADEMIC SUPPORT SPACE / OFFICE
PHYSICAL EDUCATION
MUSIC
ART
GIFTED & TALENTED
TECHNOLOGY LAB
MEDIA CENTER
MECHANICAL / SERVICE
PORTABLE
6
PORTABLE
8
PORTABLE
7
PORTABLE
7
FIFTH GRADE
FOURTH GRADE
THIRD GRADE
FIRST GRADE
SECOND GRADE
KINDERGARTEN
PRE-K
KINDERGARTEN
12
11
10
3
4
9
1
2
5

PROPOSED SITE PLAN

* The following items are designated with numbers **circles** on the site plan on the following page.

1. New administration addition.
2. New classroom addition.
3. Potential outdoor classrooms.
4. Existing bus loop and parking: Repaved with new curb and gutter.
5. Existing additional overflow parking.
6. Existing student drop-off: New sidewalk provided at perimeter.
7. Existing kindergarten play area.
8. Not used. See item 22 below.
9. New hard play area.
10. Existing baseball field.
11. Existing multipurpose field.
12. Relocated walking path.
13. Existing service area.
14. New generator, transformer and enclosure.
15. Not used. See item 22 below.
16. Relocated handicapped parking spaces closer to the main entrance.
17. Eight new parking spaces.
18. New fire department access path.
19. Enlarged stormwater management area.
20. New activity room add alternate.
21. New entrance canopy add alternate.

PROPOSED CONSTRUCTION DOCUMENTS SITE PLAN ADJUSTMENTS

* The following items are designated with numbers in **squares** on the site plan on the following page.

22. Relocated grades one through three play area.


ROCK COAST ROAD
CEDAR LANE

PROPOSED FLOOR PLAN

* The following items are designated with numbers in **circles** on the floor plan on the following page.

1. Administration addition.
2. Classroom addition.
3. Building exits: Added to improve circulation flow and egress.
4. Administration: Relocated adjacent to main entrance.
5. Secure vestibule: Added to direct visitors into front office during school hours.
6. Health suite: Relocated adjacent to administration and enlarged to meet COMAR.
7. Student restrooms: Renovated to meet ADA accessibility guidelines.
8. Staff restrooms: Added additional restrooms accessible from corridors and staff lounge.
9. Kindergarten classrooms: Relocated so that all five classrooms are adjacent to each other.
10. Cafeteria expansion: Needed with the additional 100 students.
11. Second art classroom: Needed with the additional 100 students.
12. Band & strings: Relocated from portable.
13. Gifted & talented: Relocated from portables.
14. Technology lab: Relocated from portable.
15. Special education office: Relocated and accessible from corridor.
16. Classroom pods: Renovated to increase classroom size and provide enclosed extended learning rooms.
17. Gym storage: Renovated to increase size.
18. Classroom addition: Expanded by 1,200 square feet to accommodate additional program.
19. Pre-Kindergarten: Added a second classroom.
20. Staff Lounge: Relocated due to classroom addition expansion.
21. Satellite conference room: Relocated due to classroom addition expansion.
22. PTA office: Added per comments from schematic design Board of Education presentation.
23. Title I office: Relocated due to classroom addition expansion.
24. Electrical room: Relocated due to project phasing.
25. Custodial office and storage: Relocated due to the electrical room shift.
26. Student Restrooms: Relocated due to the expansion of the Pre-Kindergarten program.
27. Activity Room: Proposed location of the add alternate, adjacent to the gymnasium.
28. Entrance Canopy: Proposed location of the add alternate, adjacent to the main entrance and bus loop.

PROPOSED CONSTRUCTION DOCUMENTS FLOOR PLAN ADJUSTMENTS

* The following items are designated with the numbers in **squares** on the floor plan on the following page.

29. Mechanical Room: Reduced the size and added additional custodial space.
30. Added corridor doors so that the gym can be used after hours while limiting access to the rest of the school.


ADMINISTRATION
HEALTH / GUIDANCE / PSYCHOLOGY
DINING
ACADEMIC CLASSROOMS
ACADEMIC SUPPORT SPACE / OFFICE
PHYSICAL EDUCATION
MUSIC
ART
GIFTED & TALENTED
TECHNOLOGY LAB
MEDIA CENTER
MECHANICAL / SERVICE
THIRD GRADE
SECOND GRADE
FIRST GRADE
FIFTH GRADE
FOURTH GRADE
PRE-K
PRE-K
KINDERGARTEN

PROPOSED BUILDING ELEVATIONS

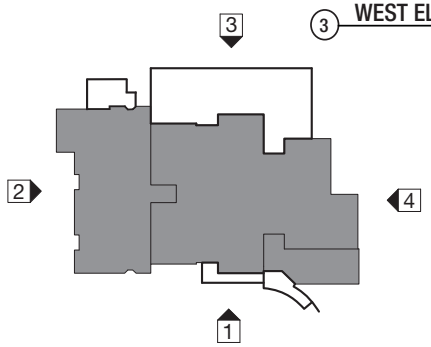
The existing Swansfield Elementary School is a one-story brick building. There are small, high windows in the 1972 and 2008 areas of the building. These openings will be enlarged to provide more daylight and views for the classroom spaces. The larger windows in the 1988 addition willl also need to be replaced due to their age and condition. The design intent for the new additions is to provide larger windows to bring more daylight into the learning spaces and a view to the bus loop from the administration offices. The replacement of the exterior windows and doors around the building provides an opportunity to make the size, finish and mullion patterns more consistent in order to tie together the existing building and the additions.

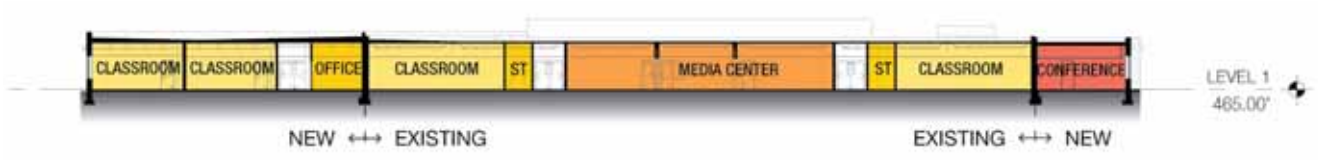
1 EAST ELEVATION

2 SOUTH ELEVATION

3 WEST ELEVATION

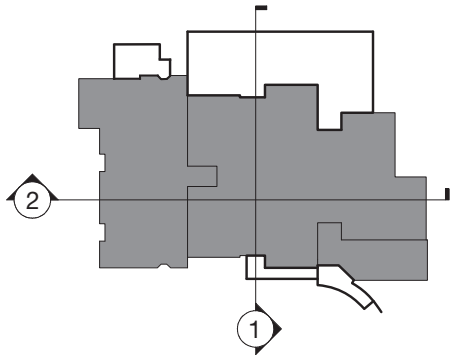
4 NORTH ELEVATION





1 EAST - WEST BUILDING SECTION

2 NORTH - SOUTH BUILDING SECTION



PROPOSED SPACE ANALYSIS

ACTIVITY / PROGRAM		SCHEMATIC DESIGN		DESIGN DEVELOPMENT		CONSTRUCTION DOCUMENTS	
DESCRIPTION		AREAS	TOTAL NET AREA	AREAS	TOTAL NET AREA	AREAS	TOTAL NET AREA
ADMINISTRATION			**3,076 SF**		**3,131 SF**		**3,108 SF**
	SECRETARIAL/RECEPTION AREA	1	503 SF	1	503 SF	1	503 SF
	PRINCIPAL'S OFFICE	1	249 SF	1	258 SF	1	256 SF
	PRINCIPAL'S PRIVATE LAVATORY	1	63 SF	1	60 SF	1	58 SF
	ASST. PRINCIPAL'S OFFICE	1	168 SF	1	201 SF	1	195 SF
	SECURE TEST PREP OFFICE	1	150 SF	1	150 SF	1	150 SF
	CONFERENCE ROOM	1	418 SF	1	409 SF	1	404 SF
	SATELLITE CONFERENCE ROOM	1	253 SF	1	229 SF	1	229 SF
	PTA OFFICE/STORAGE	1	104 SF	1	146 SF	1	145 SF
	WORK PREP ROOM WITH STORAGE	1	475 SF	1	475 SF	1	475 SF
	RECORDS ROOM	1	130 SF	1	130 SF	1	130 SF
	STAFF LOUNGE	1	504 SF	1	511 SF	1	504 SF
	TOILET ROOM	1	59 SF	1	59 SF	1	59 SF
ALS			**776 SF**		**798 SF**		**792 SF**
	CLASSROOM	1	528 SF	1	515 SF	1	508 SF
	TOILET W/ LIFT & CHANGING TABLE	1	89 SF	1	87 SF	1	87 SF
	STORAGE	1	50 SF	1	98 SF	1	98 SF
	REFLECTION ROOM	1	109 SF	1	98 SF	1	99 SF
ALTERNATIVE EDUCATION AREA			**569 SF**		**457 SF**		**463 SF**
	CLASSROOM	1	409 SF	1	311 SF	1	317 SF
	OFFICE	1	160 SF	1	146 SF	1	146 SF
CAFETORIUM/KITCHEN			**5,007 SF**		**5,142 SF**		**5,112 SF**
	STUDENT DINING	1	2,997 SF	1	2,926 SF	1	2,911 SF
	STAGE	1	362 SF	1	362 SF	1	362 SF
	ADA LIFT	1	78 SF	1	78 SF	1	78 SF
	AFTER CARE STORAGE	0	- SF	1	104 SF	1	98 SF
	CHAIR STORAGE	2	188 SF	2	272 SF	2	264 SF
	RECYCLE ROOM / STORAGE	1	171 SF	1	189 SF	1	188 SF
	KITCHEN AND SERVING	1	692 SF	1	692 SF	1	692 SF
	DISHWASHING AREA	1	208 SF	1	208 SF	1	208 SF
	DRY STORAGE	1	140 SF	1	140 SF	1	140 SF
	SOAP STORAGE	1	8 SF	1	8 SF	1	8 SF
	LOCKER/LAVATORY	1	55 SF	1	55 SF	1	55 SF
	CUSTODIAL CLOSET	1	21 SF	1	21 SF	1	21 SF
	CANWASH ROOM	1	27 SF	1	27 SF	1	27 SF
	COOLER	1	28 SF	1	28 SF	1	28 SF
	FREEZER	0	- SF	0	- SF	0	- SF
	KITCHEN OFFICE	1	32 SF	1	32 SF	1	32 SF

ACTIVITY / PROGRAM		SCHEMATIC DESIGN		DESIGN DEVELOPMENT		CONSTRUCTION DOCUMENTS	
DESCRIPTION		AREAS	TOTAL NET AREA	AREAS	TOTAL NET AREA	AREAS	TOTAL NET AREA
CLASSROOMS PK-5 and ELRs			**27,374 SF**		**27,967 SF**		**27,894 SF**
	PREKINDERGARTEN CLASSROOMS	1	925 SF	2	1,727 SF	2	1,741 SF
	PREKINDERGARTEN LAVATORIES	1	46 SF	2	118 SF	2	118 SF
	KINDERGARTEN CLASSROOMS	5	4,436 SF	5	4,351 SF	5	4,389 SF
	KINDERGARTEN LAVATORIES	5	225 SF	5	223 SF	5	223 SF
	GRADES 1-2 CLASSROOMS	10	7,454 SF	10	7,285 SF	10	7,325 SF
	GRADES 3-5 CLASSROOMS	12	9,506 SF	12	9,330 SF	12	9,242 SF
	EXTENDED LEARNING ROOMS	5	2,087 SF	5	2,099 SF	5	2,058 SF
	KINDERGARTEN PARA EDUCATOR OFFICE	0	- SF	1	144 SF	1	144 SF
	PREKINDERGARTEN STORAGE	1	49 SF	2	102 SF	2	102 SF
	KINDERGARTEN STORAGE	5	183 SF	5	198 SF	5	196 SF
	GRADES 1-5 STORAGE	5	813 SF	5	710 SF	5	676 SF
	COMMONS	5	1,650 SF	5	1,680 SF	5	1,680 SF
COMPUTER ROOM			**742 SF**		**722 SF**		**722 SF**
	COMPUTER ROOM	1	742 SF	1	722 SF	1	722 SF
CUSTODIAL AREA			**745 SF**		**705 SF**		**818 SF**
	STORAGE/VENTILATED STORAGE	1	150 SF	1	155 SF	1	192 SF
	JANITORS CLOSETS	2	193 SF	2	241 SF	2	282 SF
	OFFICE	1	165 SF	1	155 SF	1	190 SF
	EXTERIOR STORAGE	1	148 SF	1	154 SF	1	154 SF
	VENTILATED STORAGE	1	89 SF	0	- SF	0	- SF
ESOL			**351 SF**		**328 SF**		**334 SF**
	ESOL	1	351 SF	1	328 SF	1	334 SF
GIFTED & TALENTED AREA			**1,492 SF**		**1,464 SF**		**1,464 SF**
	G/T RESOURCE ROOM	2	1,492 SF	2	1,464 SF	2	1,464 SF
GUIDANCE AREA			**216 SF**		**236 SF**		**235 SF**
	GUIDANCE OFFICE/COUNSELING	1	216 SF	1	236 SF	1	235 SF
HEALTH			**733 SF**		**729 SF**		**729 SF**
	WAITING ROOM	1	115 SF	1	114 SF	1	114 SF
	TREATMENT/MEDICATION	1	107 SF	1	103 SF	1	103 SF
	REST AREA	1	157 SF	1	157 SF	1	157 SF
	OFFICE	1	107 SF	1	107 SF	1	107 SF
	EXAM ROOM	1	105 SF	1	105 SF	1	105 SF
	TOILET ROOM W/LIFT & CHANGING TABLE	1	95 SF	1	96 SF	1	96 SF
	STORAGE	1	47 SF	1	47 SF	1	47 SF
LIBRARY MEDIA CENTER			**3,827 SF**		**3,625 SF**		**3,623 SF**
	MAIN READING ROOM	1	2,226 SF	1	2,175 SF	1	2,168 SF
	TECHNOLOGY RESOURCE	1	759 SF	1	728 SF	1	733 SF
	OFFICE/WORK SPACE	1	210 SF	1	268 SF	1	268 SF
	MEDIA PRODUCTION/VIDEO AREA	1	329 SF	1	296 SF	1	296 SF
	STORAGE	1	123 SF	0	- SF	0	- SF
	TELECOMMUNICATION/EQUIPMENT (MDF)	1	180 SF	1	158 SF	1	158 SF

ACTIVITY / PROGRAM		SCHEMATIC DESIGN		DESIGN DEVELOPMENT		CONSTRUCTION DOCUMENTS	
DESCRIPTION		AREAS	TOTAL NET AREA	AREAS	TOTAL NET AREA	AREAS	TOTAL NET AREA
MATH & READING SUPPORT			**1,963 SF**		**1,958 SF**		**1,930 SF**
	MST/RST OFFICE (2 TEACHERS)	1	232 SF	1	245 SF	1	245 SF
	READING RESOURCE/SPECIALIST (3 TEACHERS)	1	407 SF	1	440 SF	1	421 SF
	READING RECOVERY ROOM (FIRST GRADE ONLY)	1	104 SF	1	104 SF	1	104 SF
	CARSON READING ROOM (GRANT PROGRAM)	1	173 SF	1	173 SF	1	173 SF
	MATH CLASSROOM	1	742 SF	1	727 SF	1	727 SF
	MATH STORAGE	1	148 SF	1	112 SF	1	103 SF
	READING STORAGE	1	157 SF	1	157 SF	1	157 SF
MUSIC			**2,059 SF**		**2,008 SF**		**1,994 SF**
	BAND & STRINGS MUSIC	1	805 SF	1	824 SF	1	815 SF
	GENERAL MUSIC	1	952 SF	1	907 SF	1	905 SF
	STORAGE	2	302 SF	2	277 SF	2	274 SF
OT/PT AREA			**288 SF**		**329 SF**		**326 SF**
	THERAPY ROOM	1	288 SF	1	329 SF	1	326 SF
PARENT LIASON			**129 SF**		**168 SF**		**167 SF**
	PARENT LIASON OFFICE	1	129 SF	1	168 SF	1	167 SF
PHYSICAL EDUCATION / GYMNASIUM			**4,172 SF**		**4,167 SF**		**4,149 SF**
	GYMNASIUM	1	3,455 SF	1	3,455 SF	1	3,455 SF
	STORAGE	1	503 SF	1	498 SF	1	480 SF
	OFFICE W/ TOILET	1	214 SF	1	214 SF	1	214 SF
PSYCHOLOGICAL SERVICES AREA			**162 SF**		**162 SF**		**162 SF**
	PSYCHOLOGIST OFFICE	1	162 SF	1	162 SF	1	162 SF
SPECIAL EDUCATION			**541 SF**		**519 SF**		**521 SF**
	OFFICE (5 TEACHERS)	1	541 SF	1	519 SF	1	521 SF
SPEECH/LANGUAGE THERAPY			**166 SF**		**184 SF**		**184 SF**
	SPEECH THERAPY	1	166 SF	1	184 SF	1	184 SF
TITLE I			**340 SF**		**355 SF**		**355 SF**
	OFFICE (3 TEACHERS)	1	340 SF	1	355 SF	1	355 SF
VISUAL ART AREA			**2,491 SF**		**2,676 SF**		**2,667 SF**
	STUDIO	2	2,100 SF	2	2,243 SF	2	2,258 SF
	KILN	1	104 SF	1	101 SF	1	95 SF
	STORAGE	1	287 SF	1	332 SF	1	314 SF
TOTAL PROGRAM AREA (NET)			**57,219 SF**		**57,830 SF**		**57,749 SF**
GROSS AREA FACTOR (WALLS, TOILETS, CIRC., MECH.)			22,559 SF		23,152 SF		23,233 SF
OVERALL BUILDING AREA (GROSS)			**79,778 SF**		**80,982 SF**		**80,982 SF**

MECHANICAL & PLUMBING NARRATIVE

General

The mechanical systems will include work associated with heating, ventillation, and air conditioning (HVAC), plumbing, gas service, controls, commissioning, and LEED. The mechanical systems, in concert with the architectural, structural, and electrical considerations, are intended to create spaces that are flexible, functional, energy efficient and respond to the needs of this facility. The mechanical design will comply with applicable codes, regulations, standards, and authorities having jurisdiction. Sustainable technologies will be incorporated into the mechanical design to achieve the goal of LEED Certified.

Applicable Codes and Standards

- 2015 International Building Code (IBC)
- 2015 International Mechanical Code (IMC)
- 2015 International Energy Conservation Code (IECC)
- 2015 International Fire Code (IFC)
- 2015 National Standard Plumbing Code
- 2015 National Fuel Gas Code
- NFPA 13: Standard for the Installation of Sprinkler Systems, latest edition
- NFPA 90A: Standard for the Installation of Air Conditioning and Ventilating Systems, latest edition
- ASHRAE 2010 through 2013 Handbooks

Design Standards

HVAC system design will be based on the following conditions:

Outdoor Design Temperatures:

- Summer: 95°F (Dry Bulb) / 78°F (Wet Bulb)
- Winter: 0°F DB

Indoor Design Temperatures (per HCPSS “Guidelines for Energy Conservation”):

- Occupied Cooling Setpoint: 76°F DB (+/-2 F) / 50 percent Relative Humidity (Maximum)
- Occupied Heating Setpoint: 70°F DB (+/-2 F)
- Unoccupied Heating Setpoint: 55°F DB (-2 F)
- Utility Space Heating: 68°F DB (occupied)

Building Occupancy Densities:

- Architectural Furnishing Plans
- Estimated Maximum Occupancy Densities Provided in IMC Chapter four

Ventilation Rates:

- Minimum Ventilation Rates: IMC Chapter four and ASHRAE Standard 62.1-2007
- Ceiling Supply Air Systems: 1.0 Ez (Zone Air Distribution Effectiveness)

Rooftop Air-Handling Unit Filtration Criteria:

- Pre-filters: 30 percent efficient
- Final filters: 85 percent efficient (for compliance with LEED IEQc5)

Life-Cycle Cost Analysis

A 20 year Life Cycle Cost Analysis has been performed to determine the appropriate mechanical system. The following system types were considered for this analysis:

- Four four-pipe Fan Coil Unit System served by a Gas-Fired Boiler and an Air-Cooled Chiller with Dedicated Outdoor Air Units.
- Four four-pipe Air-handling unit system with Variable Air Volume terminal units served by a Gas-Fired Boiler and an Air-Cooled Chiller.
- Four four-pipe Ground-source Geothermal Air-handling unit system with Variable Air Volume terminal units.
- Ground-coupled Geothermal Water Source Heat Pump System and Dedicated Outdoor Air Units.

The life cycle cost analysis concluded that the four-pipe Fan Coil Unit System served by a Gas-Fired Boiler and an Air-Cooled Chiller with Dedicated Outdoor Air Units will provide the lowest total installation, maintenance, and energy costs over the life of the equipment. The following heating, ventilating, and air-conditioning (HVAC) system description is provided to describe the selected system in more detail.

HVAC Systems

A majority of the existing mechanical systems supporting Swansfield Elementary School have exceeded their useful service life and are recommended for replacement. Those systems that will remain are described in the paragraphs below. In order to accommodate the scope of this replacement, a “phased-while-occupied” implementation of the new mechanical system components is required. New mechanical systems will be installed and operational while existing systems area removed, maintaining the operation of the existing facility throughout the duration of the construction. New mechanical components will utilize a four-pipe chilled and heating water system, helping to increase the facility’s overall energy efficiency.

A high efficiency air-cooled chiller with approximately 260-tons of cooling capacity will be located on grade adjacent to the building addition and will provide the chilled water for the facilities new four pipe system. Chilled water will be piped from the new chiller to distribution pumps located in the new mechanical room and will then be circulated throughout the building to the new mechanical equipment.

Production of heating water for the facilities new four-pipe system will be accomplished by two 3,000 MBH gas-fired condensing type boilers, located within the new mechanical room. Distribution pumps located in the new mechanical room will circulate heating water throughout the building to the new mechanical equipment.

Chilled water and heating water pumping systems will be provided with redundancy such that the operation of the building can be maintained in the event of a single pump failure. These systems will each be equipped with two fully redundant base-mounted pumps in a lead/lag configuration. In addition, these pumping systems will be equipped with variable frequency drives for reduced energy consumption during periods of reduced system demand. Along with the distribution pumps, other mechanical infrastructure components, including air separators and expansion tanks will be located within a new mechanical room area.

The existing mechanical system components serving the classroom and administration areas, including packaged direct expansion (DX) rooftop units, ductwork, and air devices will be removed in their entirety.

Ventilation for the renovated classroom and administration areas will be provided through a series of roof mounted dedicated outdoor air system units, complete with supply and return fans, filter section, dedicated chilled and heating water coils, and economizer section. Direct expansion (DX) cooling will be provided for the administration area and the four classrooms within construction phase one area. New conditioned air ductwork will extend from each roof mounted dedicated outdoor air system unit to supply air devices within each space. A ducted return air arrangement will be provided, with return air ductwork extending from each space back to the associated roof mounted dedicated outdoor air system unit.

Conditioning for the renovated classroom spaces will be provided by a series of four-pipe horizontal fan coil units located above the ceilings of the adjacent corridors and within certain rooms where sufficient space in the corridors is not available. Supply and return ductwork will extend from the fan coil units to air devices in each classroom ceiling. Return air devices will be mounted near the floor within each classroom space, helping to promote good room thermal comfort. Conditioning for the administration areas as well as various other offices, the adjacent four classrooms, and smaller teaching spaces will be provided by a series of air-cooled variable refrigerant flow terminal units located either in the ceilings or mounted on the walls within these spaces.

The existing mechanical system components serving the media center and associated media center support areas will be removed in their entirety. Space conditioning and ventilation for the renovated areas will be provided through a VAV roof mounted air-handling unit, complete with dedicated DX cooling and heating water coils. Supply and return air fans will be equipped with variable frequency drives for reducing airflow quantities during periods of reduced cooling demand. New supply air ductwork will extend from the air-handling unit to the Media Center. A ducted return air arrangement will be provided, with return air ductwork extending from each space back to the rooftop air-handling unit. Return air devices will be mounted near the floor within the media center area, helping to promote good thermal comfort and avoid temperature stratification.

A single-zone VAV roof mounted air-handling unit complete with supply and return fans, filter section, dedicated chilled and heating water coils, and economizer section will serve the cafeteria and serving line areas. Supply and return air fans will be equipped with variable frequency drives for reducing airflow quantities during periods of reduced cooling demand. New supply air ductwork will extend from the air-handling unit to the cafeteria and serving line areas. A ducted return air arrangement will be provided, with return air ductwork extending from the cafeteria back to the rooftop air-handling unit. Return air devices will be mounted near the floor within the cafeteria, helping to promote good thermal comfort and avoid temperature stratification. A room carbon dioxide sensor will reduce minimum outdoor air quantities during periods of reduced space occupancy.

The existing gas-fired make-up air unit serving the kitchen area was replaced in 2011 and will remain. The exhaust fans serving the kitchen area will be replaced in-kind. Modifications to the existing kitchen rooftop unit, ductwork and piping systems within the kitchen area are currently not anticipated. Localized cooling through the installation of a ductless split type air-conditioning unit will be provided within the kitchen office.

A new heating and ventilating unit will replace the existing unit serving the gymnasium area. Heating for this unit will be accomplished through either a gas-fired burner, or through a hydronic heating coil provided within the unit. A summer ventilation system consisting of multiple exhaust fans and companion outdoor air intakes will provide increased room air-change rates during the summer months.

Exhaust air fans will be replaced throughout the school, including both indoor and roof-mounted fans.

Toilet rooms, storage rooms, and other heating-only areas will utilize hydronic heating terminals. These heating elements will be connected to the building's heating water distribution system.

Automatic Temperature Controls

The existing pneumatic control components and control equipment will be removed throughout the school. A new automatic temperature control system consisting of direct digital control (DDC) components will be provided. New damper and valve components will be provided with electric or electronic actuation. DDC components will be utilized throughout. DDC components associated with the 2008 kindergarten addition will be replaced. All control system components will be interfaced with the central HCPSS energy management control system for remote monitoring and energy management routines. All system components will be designed to meet the HCPSS automation standards and naming conventions.

Plumbing Systems

The existing incoming water service serving both the fire protection and domestic water services will be relocated under the scope of this project. All water service components will be in compliance with current plumbing codes.

The existing gas service will be replaced and relocated. The majority of gas piping within the building will be removed as the new four-pipe distribution system is installed. The new gas service will serve the boilers, water heaters, and gymnasium heating and ventilating unit (unless heating water is utilized for this equipment). Gas piping extending from the mechanical room to the gymnasium heating and ventilating unit, as well as other areas of the building, will be at the rooftop level.

The gas-fired domestic water heater will be replaced under the scope of the renovation, unless otherwise desired by the HCPSS. The new water heater will be located in the new mechanical equipment room. The existing hot water infrastructure components, including associated circulation pumps, expansion tanks, and thermostatic mixing valve will also be replaced under the scope of the renovation. Existing piping will be modified as needed.

All existing domestic water (cold, hot, and recirculation) piping mains will be replaced with new piping, valves and accessories throughout the building. Branch piping systems will be replaced to accommodate revised architectural floor plan and new plumbing fixture locations.

The existing plumbing fixtures are not ADA compliant will be replaced throughout the school. All new plumbing fixtures will be institutional grade with a 1.6 gallon per flush valve on floor-mounted water closets and low flow type urinals. Lavatories will be complete with metering type faucets, complete with 0.5 gallon per minute faucet aerators.

Above-grade sanitary and vent piping systems will be replaced throughout as required for accommodating the revised architectural floor plan and associated plumbing fixture locations. Below-grade sanitary piping systems will be reused to greatest extent possible.

New storm water piping components, including roof drains, overflow drains, and above-grade storm water piping systems will be provided throughout. Below floor storm water piping systems will be reused to greatest extent possible.

Fire Protection Systems

The existing building is currently provided with sprinkler coverage throughout. The existing fire service enters the building within an interior closet and serves two sprinkler zones. Each sprinkler zone is currently equipped with a zone valve assembly. Under the scope of the renovation, the incoming fire service will be relocated to accommodate the revised architectural floor plan. The existing sprinkler heads and associated branch sprinkler piping will be removed and replaced, as required to accommodate the revised architectural floor plan, new ceiling systems, and above-ceiling mechanical system components. All work will be specified to conform to standards of the National Fire Protection Association (NFPA) and will include requirements for performance verification through hydraulic calculations.

ELECTRICAL NARRATIVE

General

The electrical systems will include work associated with the power, emergency power, lighting, lighting controls, data/voice, audio/video (instructional technology), intercommunications, sound, master clock and program, security (access control, intrusion detection, video surveillance), and fire alarm systems. The electrical systems, in concert with the architectural and mechanical considerations, are intended to create spaces that are flexible, functional, energy efficient and respond to the needs of this facility. The electrical design will comply with applicable codes, regulations, standards, and authorities having jurisdiction. Sustainable technologies will be incorporated into the design to achieve the goal of LEED Certified.

Applicable Codes and Standards

- Americans with Disabilities Act (ADA) Standards for Accessible Design, 2010
- IEEE Standards, Power and Telecommunications
- IESNA Lighting Handbook, 10th Edition
- International Building Code (IBC), 2015 Edition
- International Energy Conservation Code (IECC), 2015 Edition
- Life Safety Code, NFPA 101, 2015 Edition
- Maryland Occupational Safety and Health Act (MOSH Act)
- National Electrical Code (NEC) with local amendments, NFPA 70, 2014
- National Electrical Manufacturers Association (NEMA), standards
- National Fire Alarm and Signaling Code, NFPA 72, latest edition

Electrical Service

The existing 120/208V electrical service for the building will be replaced with a new 277/480V electrical service. There will be an outdoor BGE pad-mounted utility transformer located in the service yard near to the new main electrical room of the school. (The front of the utility transformer will be within 20 feet from the service driveway.) A secondary service concrete-encased ductbank (with minimum eight ducts) will be run from the utility transformer to the CT section of the main switchboard in the new main electrical room.

Power Distribution

The existing power distribution system (120/208-volt electrical equipment, devices, and branch circuit wiring) for the building will be replaced in its entirety.

The new main electrical room will be installed in the addition, consisting of a 2000A 277/480-volt, three-phase, four-wire main switchboard, distribution panelboards, dry-type step-down transformers, lighting panelboard, branch circuit panelboards, and generator-connected equipment. Generator-connected equipment will consist of automatic transfer switches, dry-type transformers, and branch circuit panelboards.

The existing 120/208-volt electrical service will be maintained during construction. The new main distribution switchboard will back-feed the existing 120/208-volt electrical service equipment via temporary step-down transformer. The existing BGE electrical service will need to be maintained until electrical equipment in the new main electrical room is energized and feeders are run to back-feed the existing electrical service equipment. The addition concept for the proposed building addition will not interfere with the existing electrical service. Therefore, the existing electrical service can be maintained while the proposed building addition is being constructed.

Panelboards will be rated at 277/480 volts and 120/208 volts. There will be dedicated panelboards for lighting, mechanical loads, general receptacle loads, and "clean power" computer receptacle loads. Panelboards will have a copper bus structure. Panelboards will be sized with approximately 25 percent spare capacity and 25 percent spare breaker space. Computer panels will have a 200 percent rated neutral bus to account for harmonic distortion. A three-phase surge protective device (SPD) will be connected to (and mounted adjacent to) each respective computer panel.

The typical dry-type transformer will have a 480-volt delta primary and 208/120-volt, three-phase, four-wire, wye secondary. Transformers serving general receptacle panelboards will be general-purpose, energy-efficient type, complying with NEMA TP-1. Transformers serving computer panelboards will be UL K-13 type.

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

Receptacle branch circuits will utilize number 12 wiring when the run is 50 feet or less, number 10 wiring when the run is between 50 and 100 linear feet, and number eight wiring when the run is more than 100 linear feet in length. Power wiring will be installed in raceway/conduit. Type MC cable will be limited to a maximum six-foot length to serve luminaires (lighting fixtures).

Emergency Public Shelter Requirement

The Maryland Emergency Management Agency (MEMA) may designate Swansfield Elementary School as an emergency public shelter. The project is currently being reviewed by MEMA to determine the need and requirements for Swansfield Elementary School to function as an emergency public shelter. If the school is designated by MEMA and the HCPSS as an emergency shelter, individual spaces for shelter and requirements will be defined.

Electrical equipment for the MEMA emergency public shelter will include an outdoor 1200A generator docking station or quick-connect generator switchboard. The outdoor docking station shall connect to a new double ended main switchboard with a 1200A main to serve 277/480V lighting panels, step-down transformers, serving receptacles in areas designated

as emergency public shelter areas such as gymnasium, cafeteria and kitchen. The outdoor docking station shall also serve all mechanical equipment and 120/208V distribution panelboard.

Emergency Power Distribution

The existing outdoor 20-kW generator will be replaced with a new outdoor natural-gas generator in a weatherproof enclosure to be located in the service yard near the new main electrical room of the school. The generator will be rated at 277/480 volts, three-phase, four-wire. The generator will be sized at 125 kW and be connected to two automatic transfer switches (ATS) located in the main electrical room.

ATS number 1 will be the "life safety" ATS and will serve emergency panelboards. Emergency panelboards will provide power to emergency egress lighting in corridors and classrooms, and exit signs. ATS number 2 will be the "standby" ATS and will serve the automatic temperature controls/energy management control system panels, kitchen refrigerator and freezer, data/voice communications equipment, intercom equipment, security equipment, fire alarm equipment, heat trace, sump pumps, and other equipment and devices as determined by the HCPSS. The "standby" ATS will also serve selected receptacles in the principal's office, main office, health suite, corridors, gym, cafeteria, and kitchen.

Lighting and Lighting Controls

The existing lighting and associated lighting controls do not comply with the requirement of IECC Standard and are not suitable for LEED certification. Therefore, lighting and lighting controls will be replaced in its entirety.

Building lighting will generally consist of recessed two foot by two foot troffer-type lensed luminaires (lighting fixtures). These luminaires will utilize either 4000K LED light sources with electronic LED drivers. Building lighting will also include high-bay LED luminaires in the gymnasium, recessed LED downlights in selected areas, industrial-type luminaires for support spaces with open ceilings, LED exit signs with red lettering, exterior perimeter building mounted full-cutoff LED luminaires, and exterior pole mounted full-cutoff LED luminaires at parking lots (with finish selected by the Architect). Luminaires in the cafeteria and media center will be suspended and surface mounted LED luminaires.

The lighting design will comply with IECC Standard, which states that the lighting power density (LPD) will not exceed 0.87 watts per square foot for the entire school. The selection of lighting fixtures for the building will be compliant with the energy standard.

Lighting levels will be designed in accordance with the recommendations of the Illuminating Engineering Society of North America (IESNA). Maintained illumination values will be calculated using a total maintenance factor of 80 percent. Classrooms will have an average between 30 and 50 foot-candles at the task plane.

Switching of luminaires will be both multi-level and zoned as appropriate for the room's use. Occupancy sensors will be used for interior lighting and a lighting relay/switching panel will be used for exterior lighting.

Lighting controls in each classroom will include a dedicated lighting room controller (to be located in the ceiling space above the entrance door), two low-voltage lighting control stations, and ceiling occupancy sensor(s). The lighting control station at the entrance door will be two-button for OFF and 50 percent lighting level. The lighting control station at the teacher's desk will be multi-button for OFF, 50 percent lighting level, 100 percent lighting level, audio/video (AV) modes, and raise/lower lighting level capability. One luminaire in each classroom will also be connected to an emergency lighting circuit (via transfer relay) and will be automatically switched ON during a power outage.

Existing wall box dimmers for stage lighting will be replaced with a lighting control system using low-voltage lighting control stations connected to a dimming panel.

Automatic daylight controls (photocontrol with dimming ballasts) for daylight harvesting will be utilized only where required per IECC Standard, Chapter C405. Daylight harvesting will be required in rooms with vertical glazing (or primary sidelighted area) with a total of more than 150 watts of general lighting within sidelight daylight zones. Also, daylight harvesting will be required in rooms with skylights with a total of more than 150 watts of general lighting within toplight daylight zones. Automatic daylight controls (photocontrol with dimming ballasts) for daylight harvesting where not required by IECC Standard, will not be considered.

Data/Voice Systems

The existing data cabling infrastructure will be replaced with a new data cabling infrastructure to include equipment data racks, active data hardware, uninterruptable power supply (UPS) for each rack, wireless access points, fiber optic backbone cables, data patch panels, 1-foot data patch cords, Category six blue data cables, Category six VoIP (voice-over internet protocol) data cables, jacks, outlet boxes, conduits and raceways, and conduit sleeves through walls and floors for the installation of data cabling. Analog voice cables will also be provided for the fire alarm system.

Audio/Video (Instructional Technology) Systems

The existing media retrieval system and associated coaxial video cabling will be removed. New coaxial video cabling will not be installed.

The general classroom design will include a DVD/Blu-ray player, audio mixer/amplifier, audio override relays, and teacher wardrobe outlet housed in the teacher's wardrobe. The general classroom will also have a wall-mounted LCD short-throw projector, ceiling-mounted wireless microphone and media interface, ceiling speakers, high projector outlet, low projector outlet, and associated cabling. The audio mixer/amplifier, wireless microphone and media interface, and ceiling speakers are for classroom sound enhancement. Outlet jack configurations and connections will be in accordance with the latest HCPSS standards.

Intercommunications, Sound, Master Clock and Program Systems

The existing Rauland Telecenter 21 intercom equipment rack/cabinet in the main office will be replaced with a new central intercom equipment rack/cabinet to be located in the new main telecom (MDF) room. The intercom system will interface with the owner's telephone system. Classrooms, instructional spaces, corridors, and large toilet rooms will have ceiling-mounted speakers. Offices and support spaces will have ceiling mounted speakers and wall-mounted volume control switches. The existing cafeteria local sound system will remain, but a CD/MP3 player and new performance ceiling speakers will be added. The gymnasium local sound system will be upgraded to include a CD/MP3 player.

Access Control System

The existing door access control panel by AMAG will be replaced in its entirety with a new AMAG control panel to be located in the new main telecom (MDF) room. New proximity card readers will be provided at locations determined by the HCPSS.

Intrusion Detection and Alarm System

The existing intrusion detection system by Ademco will be replaced in its entirety with a new Bosch intrusion detection system. The Bosch control panel should be located in the new main telecom (MDF) room. Keypads and wall-mounted motion detectors will be provided at locations determined by the HCPSS.

Video Surveillance System

The existing video surveillance system network video recorder (NVR) by TruVision (UTC/interlogix) DVR 60 with four terabytes of storage will be relocated to the new main telecom (MDF) room. Interior IP-based dome-type cameras with motorized varifocal lenses and exterior IP-based bullet-type cameras with motorized varifocal lenses will be provided at locations determined by the HCPSS.

Fire Detection and Alarm System

The existing fire alarm control panel (FACP) by Pyrotronics, System three, will be replaced in its entirety with a new fire alarm control panel with voice evacuation to be located in the new main telecom (MDF) room. Existing fire alarm devices, including duct-type smoke detectors, will be removed and replaced with new fire alarm devices. Initiation devices and notification devices will be located to meet code requirements. The fire alarm system will be designed to comply with State of Maryland Fire Code, local authorities having jurisdiction, International Building Code, and NFPA.

ENERGY STATEMENT

Energy conservation is an important goal for the design and renovation of Swansfield Elementary School. Many energy saving techniques are incorporated into the building to achieve maximum energy efficiency, including the following:

- Mechanical systems will exceed the energy efficiency requirements mandated by the 2015 International Energy Conservation Code and ASHRAE Standard 90.1-2010.
- Mechanical systems (pumps and fans) will include variable frequency drives to allow systems to operate at lower capacities when building loads are reduced. Premium efficiency motors will be specified for all fans and pumps and all non-variable frequency drive motors over 10 HP will be power-factor corrected to 90 percent minimum.
- Rooftop air-handling unit systems will incorporate dry-bulb economizer control allowing the use of “free cooling” when outdoor air temperature and humidity conditions permit. Systems will include MERV 13 filtration to improve indoor air quality.
- Mechanical systems will be designed to maximize indoor air quality by effectively mixing and delivering fresh air to building occupants. Rooftop unit systems will include airflow monitoring stations on outdoor air connections to assure the delivery of outdoor air.
- High-occupancy areas will include carbon dioxide monitoring to reset the quantity of outdoor air required during periods of reduced occupancy.
- Environmentally friendly refrigerants will be specified for mechanical equipment to meet ozone depletion and global warming thresholds.
- Mechanical systems will be designed to allow occupants to control temperature within their zone and will meet the requirements of ASHRAE Standard 55.
- The HVAC system will be controlled by the latest generation of computerized energy management equipment.
- The HVAC system will be divided into multiple zones of operation for efficient year-round and after-hours use.
- Specifications will exclude materials that lead to poor indoor air quality.
- Low-flow plumbing fixtures will be specified to reduce overall building water usage. Specific strategies will include two-position flush valves for water closets, low flow type urinals, low-flow aerators and low-flow shower heads.
- Occupancy sensors to automatically turn OFF lighting in spaces that are unoccupied.
- Daylight harvesting and lighting controls zoned by lighting fixture layout in rooms (that require automatic daylight controls per IECC to minimize energy consumption).
- Energy saving lamps and ballasts (or LED light sources and LED drivers) specified in every luminaire (lighting fixture).

CONSTRUCTION COST ESTIMATE

	SCHEMATIC DESIGN PHASE	DESIGN DEVELOPMENT PHASE	CONSTRUCTION DOCUMENTS PHASE
Phasing & Temporary Facilities:	$ 2,197,602	$ 2,231,739	$ 2,355,578
Site Work:	$ 752,630	$ 1,563,824	$ 1,664,782
Additions:	$ 3,910,782	$ 4,165,921	$ 4,470,916
Renovations:	$ 11,413,406	$ 10,620,167	$ 11,204,929
TOTAL:	$ 18,274,420	$ 18,581,651	$ 19,696,205

1. Construction cost estimate was prepared by the construction manager, J. Vinton Schafer & Sons, Inc., and assumes bids will be received in February 2016.
2. Estimate assumes a construction documents phase contingency of three percent.
3. Estimate accounts for wage rates.
4. Three add alternates are being proposed for the school:
    - Activity Room Add Alternate $422,648
    - Entrance Canopy Add Alternate $ 70,564
    - Sod on the Softball Field Add Alternate $ 27,900
5. Estimate does not include a project contingency.


SWANSFIELD CAFE
EXIT


SWANSFIELD ELEMENTARY SCHOOL