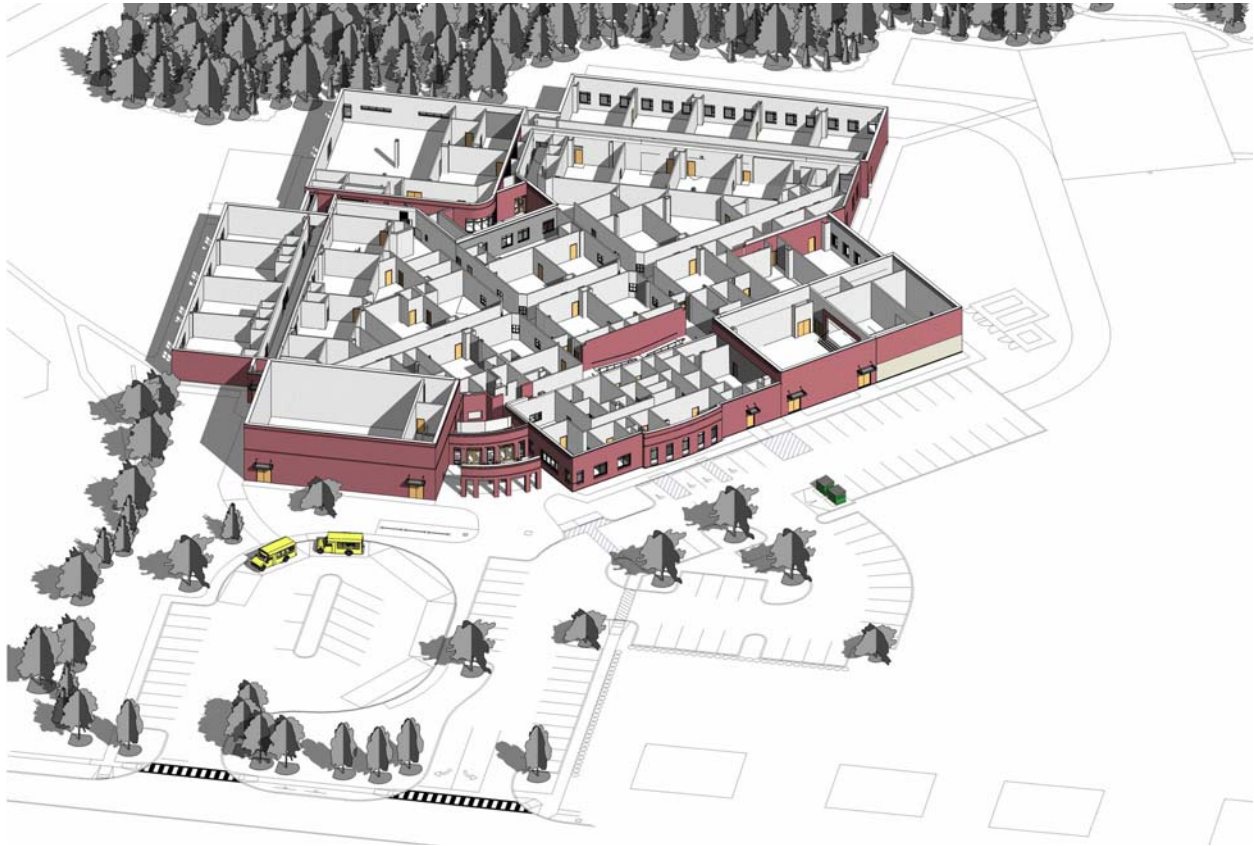


# Renovation and Additions to **Longfellow Elementary School**

## Construction Documents Report



**HOWARD COUNTY PUBLIC SCHOOL SYSTEM**

August 15, 2013



Smolen ■ Emr ■ Ilkovitch Architects [office@seearch.com](mailto:office@seearch.com)



# Construction Documents Report

August 15, 2013

## Renovation and Additions to Longfellow Elementary School

### FOR THE BOARD OF EDUCATION OF HOWARD COUNTY:

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# Table of Contents

Planning Advisory Committee Members .....	5
Design Development and Construction Document Participants .....	6
Continuation of the School Design Process.....	7
Project Description .....	8
Project Facts and Schedule .....	9
"Green" and Sustainable Design Considerations .....	10
Vicinity Map.....	12
Existing Site Plan Notes .....	14
Existing Site Plan Graphic	
Proposed Construction Document Site Plan Notes .....	16
Construction Document Site Plan Refinements	
Proposed Site Plan Graphic	
Existing Floor Plan Notes .....	18
Existing Floor Plan Graphic	
Proposed Construction Document Floor Plan Notes .....	21
Construction Document Floor Plan Refinements	
Proposed Floor Plans Graphic	
Proposed Space Analysis .....	24
Proposed Mechanical Narrative.....	28
Proposed Electrical Narrative .....	31
Proposed Cost Estimate .....	34

## Planning Advisory Committee Members:

Laurel Marsh .....Principal, Longfellow Elementary School  
Dan Notari .....Assistant Principal, Longfellow Elementary School  
Michelle Baker .....Teacher, Longfellow Elementary School  
Laurie Buckland .....Teacher, Longfellow Elementary School  
Laura Boggs-True .....Teacher, Longfellow Elementary School  
Lizabeth Sitkoff .....Teacher, Longfellow Elementary School  
Susan McHale .....Teacher/Parent, Longfellow Elementary School  
Lauren Dolinger Few .....Parent  
Lucas Webster .....Parent  
Steve Horuath .....Parent  
Ken Roey .....Chief Facilities Officer, HCPSS  
Bruce Gist .....Director, School Construction  
Dan Keiser .....Program Manager, School Construction  
Scott Washington .....Manager of Design and Preconstruction Services, School Construction  
Ron Miller .....Manager, Safety Environment and Risk Management, HCPSS  
Betsy Zentz .....Interagency Specialist, HCPSS  
Gloria Mikolajczyk .....School Facilities Architect Supervisor, IAC  
James W. Emr, AIA .....President, Smolen ■ Emr ■ Ilkovitch Architects  
Daniel Lubeley .....Project Manager, Smolen ■ Emr ■ Ilkovitch Architects  
David Fischer, LEED AP .....Project Architect, Smolen ■ Emr ■ Ilkovitch Architects  
Jonathan Dickinson .....Construction Manager, Lend Lease

## Design Team:

Howard County Public School System ..... Owner  
Smolen ■ Emr ■ Ilkovitch Architects ..... Architect  
Fisher, Collins and Carter, Inc. .... Civil Engineer  
Meyer Consulting Engineers ..... Structural Engineer  
Gipe Associates ..... Mechanical / Electrical / Plumbing Engineers  
TerraLogos ..... LEED Consultant  
Gale Associates, Inc. .... Roofing Consultant  
Nyikos Associates, Inc. .... Kitchen Consultant  
Henning Associates, Inc. .... Acoustical Consultant

## Howard County Public School System Building Services:

Jon Naill	Todd McMahon	Al Mullinix	Greg Connor
Ted Ludicke	Jim Kramer	Hummy Khan	Kevin Miller
Glenn Fowler	Tim Heinrich	Olivia Claus	

## Design Development and Construction Documents Participants:

Laurel Marsh .....	Principal, Longfellow Elementary School
Dan Notari .....	Assistant Principal, Longfellow Elementary School
Michelle Bennett.....	Principal's Secretary, Longfellow Elementary School
Cecilia Booth .....	Teachers' Secretary, Longfellow Elementary School
Sue Brown .....	Teachers' Secretary, Longfellow Elementary School
Susan McHale.....	Cluster Nurse, Longfellow Elementary School
Amy Spencer.....	Health Assistant, Longfellow Elementary School
Erica Kennedy.....	Speech, Longfellow Elementary School
Laurie Buckland .....	Special Education, Longfellow Elementary School
Deborah Owen .....	Title-I, Longfellow Elementary School
Jennifer Stairs .....	Math Support, Longfellow Elementary School
Danielle Gwinn .....	3rd Grade, Longfellow Elementary School
Jason Poirier .....	4th Grade, Longfellow Elementary School
Shayla Bright.....	5th Grade, Longfellow Elementary School
Tina Lewis .....	Reading Team, Longfellow Elementary School
Catherine Smith .....	Reading Team, Longfellow Elementary School
Kathleen Griffith .....	Reading Team, Longfellow Elementary School
Maxine Drazenovic.....	ESOL, Longfellow Elementary School
Iram Weaver.....	ESOL, Longfellow Elementary School
Matthew C. Winner.....	Library Media Specialist, Longfellow Elementary School
Michelle Baker.....	Technology, Longfellow Elementary School
Diana Fay Williams .....	Instrumental Music, Longfellow Elementary School
Lori Jenner .....	Counseling, Longfellow Elementary School
Sara Croushler .....	Alternative Education, Longfellow Elementary School
Catherine Panzer .....	Psychologist, Longfellow Elementary School
Andrea Goldberg.....	Speech Pathologist, Longfellow Elementary School
Amy Potler.....	Occupational Therapist, Longfellow Elementary School
Ali Moschetta.....	RECC, Longfellow Elementary School
Sandra Alger .....	Art, Longfellow Elementary School
Laura Boggs-True .....	2nd Grade, Longfellow Elementary School
Tiffany Lamont .....	1st Grade, Longfellow Elementary School
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Mark Coates .....	Fine Arts Coordinator, Howard County Public School System
Gino Molfino .....	Visual Arts, Howard County Public School System
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Joan Ogatis .....	Occupational Therapy, Howard County Public School System
Linda Flanagan .....	Special Education, Howard County Public School System
Daniel Lubeley .....	Project Manager, Smolen ■ Emr ■ Ilkovitch Architects
David Fischer, LEED AP .....	Project Architect, Smolen ■ Emr ■ Ilkovitch Architects
Jim Ratino .....	The Library Store
Tim Ervin .....	Douron, Inc.

## Continuation of the School Design Process

This construction document report is intended to explain and illustrate those aspects of the renovation and additions to Longfellow Elementary School design which have changed since the design development report. Included are updates on all aspects of the project that have been refined since the design development report.

The planning process for Longfellow Elementary School, the factors which influenced basic design decisions, and the basic organization of the facility were described in detail in the schematic design report submitted to the Howard County Public School System (HCPSS) Board of Education and approved on January 10, 2013.

Following approval of the schematic design report, a formal schematic design submittal was sent to the Maryland State Department of Education (MSDE) and later approved by them for the continuation of the design process on February 19, 2013.

Noteworthy refinements to the project since schematic design approval are listed below:

1. The concept plan was developed with participation of the school staff, the HCPSS staff, and the design team. Space layout plans were developed and reviewed with the school staff.
2. The project facts have been updated to represent the current concept design, shown on page 9.
3. This project is proceeding on time with the posted project schedule, shown on page 9.
4. As it is a goal of this project to achieve a "Certified" status, a preliminary Leadership in Energy and Environmental Design (LEED) score card has been provided, shown on page 10.
5. Proposed site plan refinements are noted on page 16.
6. Proposed floor plan refinements are noted on page 22.
7. The proposed space analysis, starting on page 24, includes the schematic design, design development, and construction document square footages for the proposed plan.
8. The cost estimate has been updated by the construction manager based on the construction document proposed plan.
9. Several security measures have been incorporated into the design. Examples of the security measures incorporated are bringing the administrative suite to the front of the building, providing a secure vestibule, locking all exterior doors during school hours, providing a direct corridor from the entrance to the kindergarten rooms, and providing lockable doors in the corridors.

Noteworthy developments and coordination efforts since the design development approval:

Since the design development report was approved to proceed into construction documents by the Board, the project has continued to progress and is on schedule to bid in November. The design team has continued to meet with staff members of the HCPSS, including members of the facilities department, the curriculum staff, and the school. Additional meetings are scheduled to continue further collaboration.

Project refinements have been noted on page 16 for the proposed site plan and on page 22 for the proposed floor plan.

Located in the village of Harper's Choice, the project has been reviewed with the village manager and with neighbors adjacent to the school site. The project was approved and was subsequently submitted to the Department of Planning and Zoning where it was approved to proceed. The site development plan is currently in the signature stage of the process.

## Project Description

Longfellow Elementary School, located on Hesperus Drive, was one of the first schools built in the Columbia area. The single story facility has two high volume spaces housing the cafetorium and gymnasium. The original facility was constructed in 1970 and renovated in 1987. Further additions and renovations were performed in 1994 with the addition of classrooms and the gymnasium, and in 2008 which included the all day kindergarten program. The current square footage of the facility is 56,458 gross square feet (gsf) with a State Rated Capacity (SRC) of 468. The school currently utilizes two temporary portable classrooms to house a technology and a string music classroom.

The project is proceeding in compliance with the HCPSS "Guidelines Manual for Renovations and Modernizations of Existing Schools." Under this direction, all teaching spaces will achieve the minimum 660 sf, but will strive to be 750 sf each.

The primary focus of this project is to address the conversion of the open space teaching pods into individual classrooms. In addition to the conversion of the teaching pods, the administrative suite will be relocated to the front entrance, and the health suite will be developed to meet the current MSDE standards. In providing this reconfiguration, a design direction was taken that improves the current use and flow of the building. Departing from the open pod concept, grade clusters are formed to maintain cohesion between the individual grade levels.

To aid in the interior renovations of the school, several additions are proposed to relocate key programs within the building to free interior space. The additions are as follows:

1. *Classroom addition:* This addition, provided along the rear of the facility, is to help address the program space deficiencies in the existing school. This addition also allows for swing space during construction. The addition addresses these spatial needs while maintaining the local capacity of the school.
2. *Stage and music classroom addition:* This addition located by the playfields will provide space to bring the strings music classroom into the main building. The strings room will be clustered next to a general music classroom, both of which will be across the main corridor from a new handicap accessible stage. The new stage will replace the existing undersized and inaccessible stage. New mechanical spaces will be added at this location to support the renovations and phasing.
3. *Courtyard infill addition:* The addition will infill the courtyard by the gymnasium which is irregular in shape and seldom used. Storage and breakout space will be included, as



well as a corridor to provide a direct interior link from the early education programs to the main entrance and administrative suite.

In conjunction with the additions, extensive interior renovations within the school are planned. These plans include relocating the administrative suite to the main entrance which will provide a secured vestibule, create a health suite compliant with the current Code of Maryland Regulations (COMAR) requirements, provide individual classrooms with walls continuous to the roof deck above, renovate the heating, ventilation, and air condition (HVAC) system for the entire facility, and simplify the circulation including addressing the multiple levels.

It is the intent of this project to achieve a LEED "certified" designation. This is to include an energy assessment on the existing facility and proposed design. Further information can be found on page 10.

## Project Facts

	Schematic Design	Design Development	Construction Documents
Existing Building Square Footage:	<b>56,458 GSF</b>	<b>56,458 GSF</b>	<b>56,458 GSF</b>
Area of Demolition:	<b>682 GSF</b>	<b>1,584 GSF</b>	<b>1,596 GSF</b>
Area of New Additions:	<b>12,405 GSF</b>	<b>13,407 GSF</b>	<b>13,728 GSF</b>
Proposed New Total Building Square Footage:	<b>68,181 GSF</b>	<b>68,281 GSF</b>	<b>68,590 GSF</b>

## Project Schedule

Planning Meetings Completed:	<b>December 3, 2012</b>
Schematic Design presented to Board of Education for Review and Approval:	<b>January 10, 2013</b>
Design Development presented to Board of Education for Review and Approval:	<b>April 25, 2013</b>
Construction Documents presented to Board of Education for Review and Approval:	<b>August 15, 2013</b>
Project out for Bids: (1 month)	<b>October 2013</b>
Bids Received:	<b>November 2013</b>
Construction Starts:	<b>February 2014</b>
Construction Completed: (19 months)	<b>August 2015</b>

# "Green" and Sustainable Design Considerations

The Longfellow Elementary School renovation and addition project is aspiring to become a LEED certified project. Through the U.S. Green Building Council (USGBC), this project will follow the USGBC 2009 Edition of "LEED for SCHOOLS" in order to obtain this certification. The four levels of certification through the USGBC are: Certified, Silver, Gold, and Platinum.

The underlying goals of becoming a certified "Green" building are to conserve energy and water and provide healthier materials, which in turn help provide a better environment and help reduce negative impacts on the facility's occupants and the environment. In order to achieve this goal, the design team includes TerraLogos, a LEED consultant that will work closely with the rest of the design team to help develop and maintain the project goals.

An initial "LEED workshop" was held on March 7, 2013, to determine the specific credits the design team will incorporate into the design. TerraLogos conducted the workshop in conjunction with the rest of the team, establishing LEED goals for the project. TerraLogos will continue to review the individual systems within the project's design to help guide the team towards the appropriate goals. Included is the "working" LEED scorecard which identifies the potential credits the project is striving to achieve.

LEED for Schools 2009 Credit Scorecard  
Longfellow Elementary School



## 12 Sustainable Sites

- Prereq 1. Construction Activity Pollution Prevention
- Prereq 2. Environmental Site Assessment
- 1 Credit 1 Site Selection
- 4 Credit 2 Community Connectivity
- 1 Credit 4.2 Alt. Transportation - Bicycle Storage & Changing Rooms
- 2 Credit 4.3 Alt. Transportation - Low-Emitting and Fuel-Efficient Vehicles
- 2 Credit 4.4 Alt. Transportation - Parking Capacity
- 1 Credit 5.2 Site Development - Maximize Open Space
- 1 Credit 10 Joint Use of Facilities

## 8 Water Efficiency

- Prereq 1. Water Use Reduction - 20% Reduction
- 4 Credit 1 Water Efficient Landscaping - No Potable Water Use
- 3 Credit 3 Water Use Reduction - 35 % Reduction
- 1 Credit 4 Process Water Use Reduction

## 8 Energy and Atmosphere

- Prereq 1. Fundamental Commissioning of Building Energy Systems
- Prereq 2. Minimum Energy Performance
- Prereq 3. Fundamental Refrigerant Management
- 4 Credit 1 Optimize Energy Performance
- 2 Credit 3 Enhanced Commissioning
- 2 Credit 5 Measurement & Verification

## 7 Materials and Resources

- Prereq 1. Storage and Collection of Recyclables
- 1 Credit 1.1 Building Reuse - Maintain Existing Walls, Floors, and Roof
- 2 Credit 2 Construction Waste Management
- 2 Credit 4 Recycled Content
- 2 Credit 5 Regional Materials

## 11 Indoor Environmental Quality

- Prereq 1. Minimum Indoor Air Quality Performance
- Prereq 2. Environmental Tobacco Smoke Control
- Prereq 3. Minimum Acoustical Performance
- 2 Credit 3 Construction IAQ Management Plan
- 4 Credit 4 Low-Emitting Materials
- 1 Credit 6.1 Controllability of Systems - Lighting
- 1 Credit 6.2 Controllability of Systems - Thermal Comfort
- 1 Credit 7.1 Thermal Comfort - Design
- 1 Credit 7.2 Thermal Comfort - Verification
- 1 Credit 8.1 Daylight and Views - Daylight

## 5 Innovation and Design Process

- 1 Credit 1.1 Green Housekeeping
- 1 Credit 1.2 Pozzolan (Fly Ash) in Concrete
- 1 Credit 1.3 Sustainable Purchasing: Reduced Mercury in Lamps
- 1 Credit 1.4 SSc5.2 Maximize Open Space - Exemplary Performance
- 1 Credit 2 LEED Accredited Professional

## 51 Total Projected Points

LEED for Schools Rating Scale	
40-49	Certified
50-59	Silver
60-79	Gold
80-110	Platinum

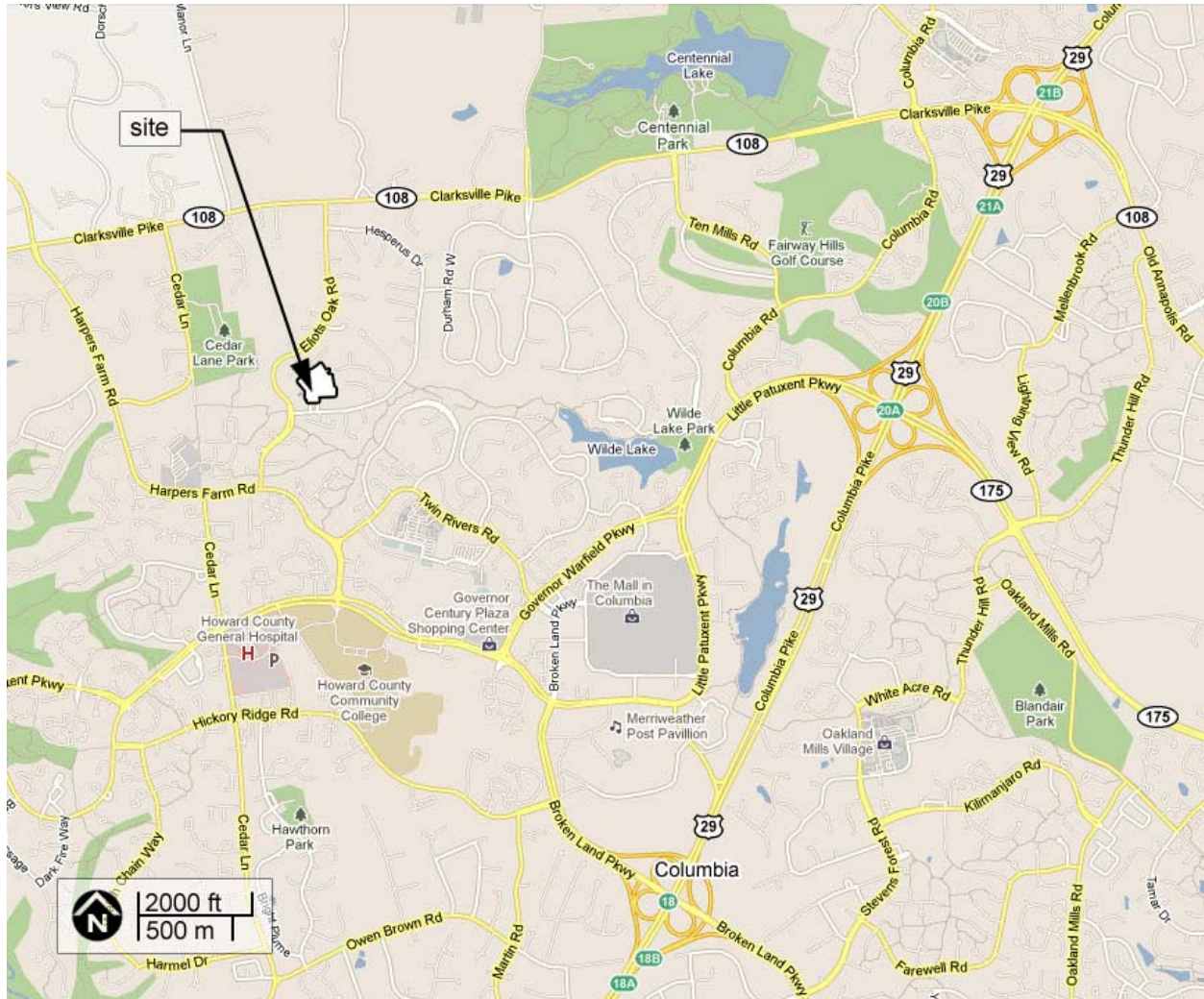
The following are examples of equipment, materials, and procedures that will be incorporated by the design team to provide a sustainable, energy efficient, and healthy environment:

- *Low Flow and Dual Flush Plumbing Fixtures:* The use of low flow urinals which use half the water of a traditional urinal will be incorporated into the design where feasible.
- *High Efficiency HVAC Equipment:* The use of high efficiency HVAC roof top equipment will be utilized in the replacement of existing units. The possible use of energy recovery units will be investigated for use where applicable.
- *CO<sub>2</sub> Sensors:* Carbon dioxide sensors will be utilized for high occupant density spaces to limit the quantity of outside air used when these spaces are not fully occupied. This would limit the amount of energy used to heat and cool these large spaces, like the gymnasium.
- *Low Emitting Materials:* Where possible, materials that are found to reduce the use of high Volatile Organic Compound (VOC) will be used to enhance indoor air quality and provide an environment free of odorous, irritating, and/or harmful indoor air contaminants.
- *Lighting Controls:* Sustainable lighting control design in a typical classroom includes low-voltage switches and occupancy sensors.
- *Recycled Materials:* Where the use is appropriate, recycled materials will be specified and used for the construction of the building.

In conjunction with striving to become a certified LEED building, the design team will be conducting an energy assessment of the existing facility and the proposed design. Gipe Associates, as part of the design team, will review the power usage of the building and provide suggestions for the design to improve energy and cost efficiency.

# Vicinity Map

Longfellow Elementary School, located at 5470 Hesperus Drive, Columbia, MD 21044, is located approximately two miles west of US 29, and one half mile south of Clarksville Pike. Located in a residential area, Longfellow Elementary School is surrounded by both detached single family homes and townhouse communities adjacent to a community swimming pool.



## Existing and Proposed Site Plan

## Existing Site Plan Notes

Key features of the existing site plan are listed below and identified by circled numbers on the site plan on the following page.

Longfellow Elementary School is situated off Hesperus Drive by the corner with Eliots Oak Road in Columbia, MD. The school is situated in a residential area and is located adjacent to a community pool.

1. Two site connections off Hesperus Drive utilizing a single entrance and single point exit for the traffic pattern.
2. Main entrance to the school is a sloped sidewalk which does not meet the requirements of the Americans with Disabilities Act (ADA).
3. A large portion of the 9 acre site at the southeast corner has a dramatic grade change, limiting the use for play.
4. Two temporary portable classrooms located on the open play fields house a technology and strings music classrooms.
5. Hard and soft play areas for both kindergarten and upper grades.
6. The facility is tight to the property line and building restriction line on the southwest portion of the site.



## Existing Site Plan

## Proposed Construction Documents Site Plan Notes

The proposed site plan is designed to address a number of key issues of concern related to the existing site layout and associated circulation. Features of the proposed site plan are listed below and identified by circled numbers on the site plan on the following page.

1. Separation of the bus loop and parent drop off into different drive lanes, utilizing the two existing site access points.
2. The access to the parent drop off is widened to allow three lanes of traffic. This allows one lane in and two lanes out, one left turn and one right turn.
3. Sidewalks on each side of the traffic drives allow walker access to the school without crossing the traffic patterns at Hesperus Drive.
4. The school's main entrance is proposed to be reconfigured to meet all ADA requirements. A canopy has been suggested for student protection during arrival and dismissal.
5. A retaining wall is added to allow for the parking and traffic pattern reconfiguration due to existing grades.
6. Soft and hard play areas are maintained and will be redressed after the construction process.

### Design Development Site Plan Refinements:

- D1. The site adjacent to the proposed parking spaces has been graded in order to remove the need for a retaining wall in this location. With the reduced area in this location, the potential for rain water drainage into the adjacent houses is dramatically reduced.
- D2. A new line of cyprus trees is to be installed to separate the adjacent residential lot from the activities and the lighting of the school parking lot. **Cyprus trees have been removed; see note C4.**
- D3. During construction, one of the existing portable classrooms will be relocated. One, five-classroom modular and one single portable classroom will be temporarily added for additional "swing space."

### Construction Documents Site Plan Refinements:

The most noticeably updated features of the proposed site plan are listed below and identified by circled letters on the site plan on the following page.

- C1. A new school sign has been located along Hesperus Drive between the entrance drives.
- C2. All of the portable classrooms have been relocated to consolidate the classrooms for functionality and security.
- C3. An emergency access road has been extended around the rear of the five-classroom addition per request from the Fire marshal.
- C4. The proposed line of cyprus trees separating the adjacent residential lots from the school have been replaced by a privacy fence as discussed with and requested by neighbors.





## Proposed Construction Documents Site Plan








## Existing Floor Plan Notes

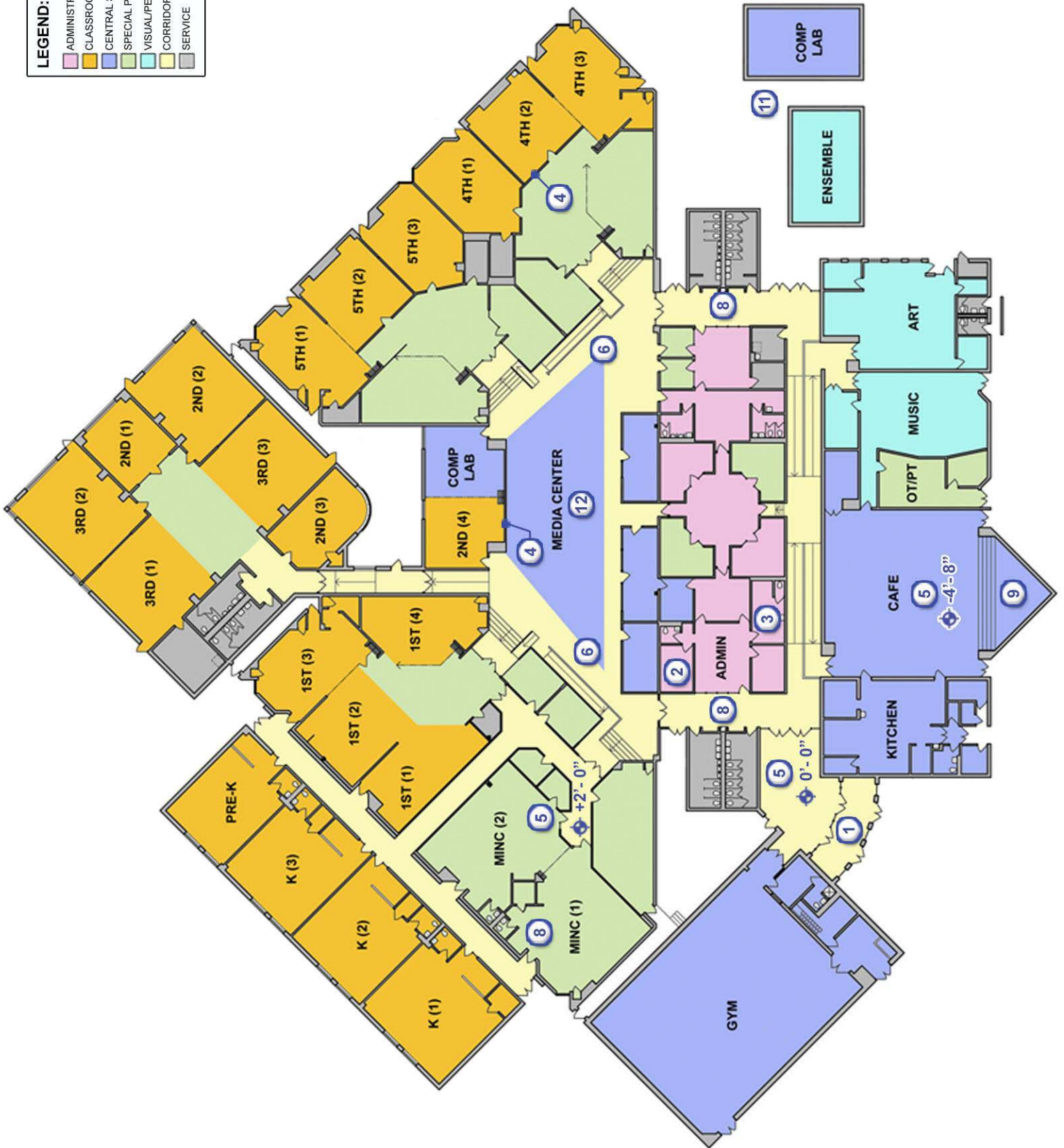
For the primary focus areas of this project, each department and support space has been color coded and indicated on the following floor plan graphics. These colors are maintained on the proposed floor plan graphic for easy reference of spaces between the two plans.

Listed below are features of the existing school and issues of concern as determined by the planning committee. The numbered items correspond to the circled numbers on the existing floor plan.

1. The main entrance to the building is separated from the administrative suite and is not able to be supervised by any regularly occupied space. The entrance corridor is intersected by a cross corridor which can be accessed prior to reaching the administrative suite.
2. The administrative suite is located off the main entrance corridor back in the middle of the building. This limits the ability to supervise the main entrance or parking area.
3. The health suite, located adjacent to the administrative suite, is undersized and does not meet the current COMAR regulations.
4. A large amount of walls separating classrooms and support spaces like the media center do not continue to the ceiling. This creates noise transfer between spaces.
5. The existing ground floor has three different levels. The difference creates an approximate six foot eight inch level change in the building.
6. The differing floor levels are reached by utilizing ramp systems that do not meet current ADA standards.
7. Special programs, including office spaces, are spread throughout the building in rooms that are shared by multiple programs.
8. Most of the limited existing toilet rooms are not handicapped accessible.
9. The existing stage is undersized and is not handicapped accessible.
10. The existing gymnasium is to remain and is not proposed to be relocated.
11. A technology classroom and a strings music room are located in two portable classrooms.
12. Media center is unenclosed and used as a circulation hub, limiting the viability of its usage as a teaching space.

**LEGEND:**

-  ADMINISTRATIVE
-  CLASSROOM
-  CENTRAL SUPPORT SPACES
-  SPECIAL PROGRAMS
-  VISUAL/PERFORMING ARTS
-  CORRIDOR
-  SERVICE



## Existing Floor Plan

## **Proposed Construction Documents Floor Plan**

## Proposed Construction Documents Floor Plan Notes

The following is the proposed floor plan which has been color coded to illustrate the addition and renovated areas of the proposed concept. The numbered items listed below correspond to the numbered circles on the proposed floor plan on the following page:

1. The administrative suite is relocated to the front of the school to provide a secured vestibule for the building as well as provide the ability to supervise the front of the site.
2. The health suite is relocated along with the administrative suite to allow for easy access in case of an emergency as well as provide the adjacency required to the reception area.
3. The three existing level changes of approximately six feet eight inches is adjusted to just two level changes creating a difference of only two feet. The cafetorium and kitchen area are raised to be at the main entrance level while the complete academic area is leveled at the higher two-foot elevation. The multitude of existing ramps and stairs are centralized to two locations, one at the main cross corridor and one at the kindergarten access corridor by the gymnasium.
4. With the infill of the front courtyard, a direct connection corridor from the main entrance to the kindergarten corridor is created for easy access without going outside the building.
5. The circulation pattern is simplified to provide easy access to all parts of the building and improve supervision throughout the building.
6. With the infill of the front courtyard, additional needed space is created for storage, classroom space, and an extended learning area.
7. The media center is relocated to the rear of the school to free up space in the center of the facility for classrooms and support spaces. This keeps the media center location central to the classrooms and out of the circulation pattern.
8. The kindergarten corridor is utilized as a double-loaded corridor with the Early Childhood Multiple Intense Needs Classes (MINC) program to better utilize the interior existing space.
9. The art room is relocated adjacent to the existing courtyard to take advantage of natural northern light exposure. This placement allows direct connection to the courtyard for outside projects. **Art room has been relocated; see note C1.**
10. A new five-classroom addition is proposed to free up space on the interior of the building for required support spaces. A double-loaded corridor is used for space efficiency.
11. A new ADA compliant stage is provided adjacent to the relocated cafetorium. Mechanical space is added at this location to add in the construction process.
12. The music and ensemble strings rooms are located across from the new stage area.

### Design Development Site Plan Refinements:

- D1. A parent volunteer room was added at the front of the building. The location places the room close to the front entrance, the work room, and the administrative suite.

- D2. The information technology distribution room, identified as IDF (Intermediate Distribution Frame) on the plans, was relocated adjacent to the parent volunteer room to help open wall space in the second grade classroom and to provide more general storage adjacent to the first and second grade clusters.
- D3. A second pair of doors has been added to the cafetorium from the corridor to aid in lunch time circulation. This door is intentionally located across from the music rooms to provide easy access to the stage for performances.
- D4. The primary grade extended learning room (ELR) was closed off from the corridors to provide a usable space for speech and MST/Title 1 and testing.
- D5. The reading recovery suite has been reorganized to allow for both the daily instruction of students and instructional observation by parents or staff.
- D6. The art room has been reconfigured to allow for greater flexibility in table layout and floor space usage. **The art room has been relocated; see note C1.**
- D7. A vestibule was added to the main corridor to allow for security and a conditioned access from the gymnasium or cafetorium to the main play fields.
- D8. Doors have been added between each adjoining classroom to promote collaboration and teamwork between the classes.
- D9. During the casework review processes, the media center and administrative suites have been coordinated with the HCPSS Purchasing Office's furniture vendors, for a fully coordinated furniture plan.
- D10. Security doors have been added to the corridors to provide the ability to close off access to the corridors in the back of the school. This allows for added internal security during night usage of the gymnasium or cafetorium, or during an emergency condition.

## **Construction Documents Floor Plan Refinements:**

The most noticeably updated features of the proposed floor plan are listed below and identified by circled letters on the floor plan on the following page.

- C1. Per discussion with the school and the HCPSS staff, the art room and its support spaces have been relocated and reconfigured to allow for a more flexible teaching environment. Tubular skylights are added to the interior room to allow for daylight.
- C2. The large ELR room that was displaced by the art room relocation has been relocated to a central location adjacent to the courtyard. Direct access has been provided to the courtyard.
- C3. Coordination with the HCPSS staff has refined the location of support spaces throughout the facility.
- C4. The stage ramp access and support spaces have been reconfigured to allow for better circulation, and allow for the corridor door of the cafetorium to be recessed. The cafetorium will be finished with polished concrete in lieu of resilient flooring.
- C5. Toilet room in MINC classroom enlarged to provide space for changing table.



## Proposed Construction Documents Floor Plan

# Proposed Space Analysis

Proposed Net Areas

ACTIVITY / PROGRAM	AREAS	TOTAL NET SQUARE FOOTAGE		
		SCHEMATIC DESIGN	DESIGN DEVELOPMENT	CONSTRUCTION DOCUMENTS
		50,182	49,441	49,410
<b>ADMINISTRATIVE SPACES</b>				
<b>ADMINISTRATIVE AREA</b>		1819	1877	1866
Reception	1	505	505	501
Conference Room	1	432	435	424
Principal Office (incl. toilet & closet)	1	261	261	257
Asst. Principal Office (incl. closet)	1	169	180	195
Testing Secure Storage	1	75	64	64
File Room	1	167	117	117
Staff Toilet	1	39	43	42
Parent Volunteer Room	1	0	101	102
BSAP / FICO	1	171	171	164
<b>TEACHER AREAS</b>		866	857	892
Teacher Lounge	1	480	485	520
Teacher Work Room	1	386	372	372
<b>GUIDANCE</b>		261	254	255
Guidance Office	1	131	123	124
Psych. Office	1	130	131	131
<b>HEALTH SUITE</b>		688	718	715
Waiting Area	1	118	109	109
Office	1	120	119	119
Rest Area	1	153	116	116
Treatment Area	1	69	148	146
Exam Room	1	120	119	119
Toilet	1	39	43	42
Storage	1	69	64	64
<b>CLASSROOM</b>				
<b>KINDERGARTEN</b>		3873	3873	3873
Pre-K (incl. toilet & storage)	1	804	804	804
K-1 (incl. toilet & storage)	1	1119	1119	1119
K-2 (incl. toilet & storage)	1	975	975	975
K-3 (incl. toilet & storage)	1	975	975	975
<b>FIRST GRADE CLASSROOMS</b>		3098	3060	3049
First Grade-1 (incl. toilet)	1	777	772	768
First Grade-2 (incl. toilet)	1	772	763	760
First Grade-3 (incl. toilet)	1	777	764	762
First Grade-4 (incl. toilet)	1	772	761	759



ACTIVITY / PROGRAM	AREAS	TOTAL NET SQUARE FOOTAGE		
		SCHEMATIC DESIGN	DESIGN DEVELOPMENT	CONSTRUCTION DOCUMENTS
<b>SECOND GRADE CLASSROOMS</b>		3154	3106	3094
Second Grade-1 (incl. toilet)	1	775	762	760
Second Grade-2 (incl. toilet)	1	775	762	760
Second Grade-3 (incl. toilet)	1	802	791	787
Second Grade-4 (incl. toilet)	1	802	791	787
<b>THIRD GRADE CLASSROOMS</b>		2465	2465	2459
Third Grade-1	1	757	756	756
Third Grade-2	1	854	853	850
Third Grade-3	1	854	856	853
<b>FOURTH GRADE CLASSROOMS</b>		2368	2362	2343
Fourth Grade-1	1	757	757	749
Fourth Grade-2	1	757	752	744
Fourth Grade-3	1	854	853	850
<b>FIFTH GRADE CLASSROOMS</b>		2465	2459	2445
Fifth Grade-1	1	854	753	746
Fifth Grade-2	1	757	853	849
Fifth Grade-3	1	854	853	850
<b>CENTRAL SUPPORT SPACES</b>				
<b>CAFETORIUM</b>		4351	4288	4220
Cafetorium	1	2311	2297	2243
Stage	1	808	805	798
Storage	1	153	146	143
Kitchen	1	1079	1040	1036
<b>ESOL</b>		154	154	182
ESOL Office	1	154	154	182
<b>LIBRARY/MEDIA CENTER</b>		4626	4600	4595
Media Center	1	2873	2833	2833
Media Office	1	245	253	253
Media Prep	1	477	473	468
Technology Resource Room	1	802	815	815
Media Storage	2	229	226	226
<b>COMPUTER ROOM</b>		702	698	698
Computer Lab	1	702	698	698

ACTIVITY / PROGRAM	AREAS	TOTAL NET SQUARE FOOTAGE		
		SCHEMATIC DESIGN	DESIGN DEVELOPMENT	CONSTRUCTION DOCUMENTS
<b>PHYSICAL EDUCATION</b>		3818	3818	3818
Gymnasium	1	3314	3314	3314
Storage	2	332	332	332
PE Office (incl. toilet & closet)	1	172	172	172
<b>VISUAL / PERFORMING ARTS</b>				
<b>MUSIC</b>		2094	2085	2032
General Music Room (incl. storage)	1	1150	1150	1107
Ensemble Room (incl. storage)	2	944	935	925
<b>VISUAL ART</b>		1024	1026	1080
Art Room	1	887	890	877
Kiln / Storage	2	137	136	203
<b>SPECIAL PROGRAMS</b>				
<b>SPECIAL EDUCATION</b>		2016	1572	1576
Special Education Room-1	1	148	149	149
Special Education Room-2	1	148	149	143
Special Education Room-3	1	239	239	239
Special Education Room-4	1	255	255	255
OT/PT	1	516	501	501
OT/PT Closet	1	0	19	29
Speech	1	140	136	136
Alternate Education Office	1	570	124	124
<b>MULTIPLE INTENSE NEEDS CLASSES (MINC)</b>		1764	1744	1727
MINC-1 (incl. toilet)	1	886	872	863
MINC-2 (incl. toilet)	1	878	872	864
<b>EXTENDED LEARNING ROOM</b>		1724	1688	1818
ELR-1	1	361	352	353
ELR-2	1	703	697	826
ELR-3	1	361	356	356
ELR-4	1	299	283	283
<b>GIFTED &amp; TALENTED CLASSROOMS</b>		1487	1479	1400
Gifted & Talented Classroom-1	1	779	775	699
Gifted & Talented Classroom-2	1	708	704	701

ACTIVITY / PROGRAM	AREAS	TOTAL NET SQUARE FOOTAGE		
		SCHEMATIC DESIGN	DESIGN DEVELOPMENT	CONSTRUCTION DOCUMENTS
<b>READING RESOURCES</b>		834	829	801
Reading Office	1	251	250	250
Reading Meeting Room	1	262	270	270
Reading Room	1	154	155	155
Reading Closet	1	167	154	126
<b>MATH RESOURCES</b>		460	391	361
MST / Title I Room	1	272	231	231
Math Closet	1	188	160	130
<b>BUILDING SERVICES</b>				
<b>GENERAL STORAGE AREAS</b>		952	991	867
Storage Areas	13	952	991	867
<b>CUSTODIAL AREAS</b>		1883	1816	1935
Custodial Office	1	214	223	227
Custodial Storage	1	0	0	94
Custodial Closets	3	116	159	213
Boys Toilets (varies in size)	4	642	585	590
Girls Toilets (varies in size)	4	642	593	596
Adult Toilets	5	269	256	215
<b>DATA ROOMS</b>		197	210	268
MDF Room	1	122	122	122
IDF Rooms	2	75	88	146
<b>MECHANICAL / ELECTRICAL ROOMS</b>		1039	1021	1031
Mechanical Room	1	903	663	672
Electrical Rooms	3	136	358	359

# Proposed Construction Documents Mechanical Narrative

## Mechanical Design:

The existing HVAC equipment and systems are beyond their useful life expectancies and will be replaced in their entirety with the exception of the 2008 kindergarten addition. The HVAC systems will utilize high efficiency equipment and control strategies to meet current design standards, building functions, and code requirements. Based on the age, condition, and air distribution system which still exists, all supply and return duct systems shall be replaced (with the exception of the 2008 kindergarten addition) to match the room layouts. This design will provide good indoor air quality, indoor environmental conditions, and noise criteria based on current state guidelines. Outside air flow rates would be increased to meet current code and American Society of Heating, Refrigerating, and Air Condition Engineers (ASHRAE) requirements. This will also increase the required cooling capacity and associated power requirements.

The HVAC system will include high efficiency packaged rooftop units (i.e. electric cooling) with gas-fired furnaces for heat, similar to the existing units in conjunction with variable air volume (VAV) terminal control units, equipped with hot water heat coils. A small heating plant utilizing variable flow high efficiency condensing type gas fired boilers will be installed. The gymnasium will be provided with a constant volume roof mounted heating and ventilating unit connected to a supply air duct distribution system using high volume combination horizontal/vertical throw terminal air devices. A supplemental ventilation air system consisting of a wall mounted propeller fan and gravity intake sized for six air changes per hour and controlled by a local timer will be incorporated into the design. Ductless split systems will be utilized in computer and electrical spaces.

## Automatic Temperature Control:

The building will be provided with an upgraded web-based automation system and be tied into the county energy management system (Johnson Controls or Tridium). The system shall have full direct digital controls and all controls shall be electric/electronic actuation. All control and monitoring points will be consistent with the county's current standards.

Automatic temperature controls will be capable of operating per the sequence of operation, including when the energy management system is manually overridden.

The basic design criteria will be as follows:

Cooling Mode:	
Outdoor Temperature:	95° F DB, 78° F WB
Indoor Temperature:	75° F DB, 65% RH or less
Heating Mode:	
Outdoor Temperature:	10° F DB
Indoor Temperature:	70° F DB

Ventilation Rates (Latest ASHRAE Standard 62):

10 CFM per person - Classrooms

.12 CFM per sq. ft.

Multi-Use Assembly:

7.5 CFM per person

.06 CFM per sq. ft.

Office:

5 CFM per person

.12 CFM per sq. ft.

### **Plumbing/Fire Protection Recommendations:**

The existing three inch water service, which extends into the building, will be replaced with a four inch distribution system. Backflow preventers and vacuum breakers will be provided to prevent back siphonage and contamination of the potable water system. The water piping will be sized per the requirements of the American Society of Plumbing Engineers and the National Standard Plumbing Code-2009.

All new plumbing fixtures will be included and shall be good commercial grade of institutional quality. Water closets and urinals shall be flush valve, water-conserving type. Faucets for lavatories will be the self-metering types. Handicapped fixtures will comply with ADA requirements. Mounting heights for all fixtures will be coordinated with the owner.

Hot and cold water will be extended to serve the fixtures and equipment as required. All domestic water piping will be copper Type L with wrought copper fittings and lead free 95-5 solder. All water piping shall be insulated with the exception of non-handicapped final branch run-outs for connection to fixtures/equipment. Domestic hot water will be generated using an ultra-high efficiency, gas fired tank type hot water heater.

Freeze-proof wall hydrants will be located every 150 feet along the building's perimeter. Also, hydrants will be provided on the roof.

The existing under-slab sanitary mains shall be reused to the fullest extent possible. The new renovations/addition will tie into the existing sanitary system. The sanitary drainage system will be sized per the requirements of the American Society of Plumbing Engineers and the National Standard Plumbing Code-2009. New piping systems (cold water, hot water and hot water circulating) will be provided. New plumbing systems will be installed in strict accordance with all applicable codes and regulations, including ADA.

The existing storm water collection system at the renovation/addition area will be removed and replaced per new building layout. New storm water drain lines will be brought to a point 5'-0" from the building exterior wall. At this point, connection will be made to the drainage line and same will be extended into the building for distribution. The storm water collection system and overflow system will be designed and sized per the requirements of the American Society of Plumbing Engineers and the National Standard Plumbing Code-2009. The existing 6" incoming

fire service will remain. The existing zones will be removed back to the existing sprinkler room. Three new zones will be installed.

**Energy Statement:**

Energy conservation is an important goal for the design of Longfellow Elementary School. Many conventional energy saving techniques are incorporated into the building to achieve energy efficiency.

The completed facility will meet current energy requirements of ASHRAE 90.1-2010 as required by the state of Maryland. The following are features incorporated into the design:

- Thermal break aluminum windows with insulating glass to reduce energy consumption.
- Carefully detailed and located insulation and weatherstripping.
- An air lock vestibule at the main building entrance.
- HVAC system controlled by the latest generation of computerized energy management equipment.
- HVAC system divided into multiple zones for efficient year-round and after-hours community use.
- Light switching zoned by lighting fixture layout in rooms to minimize energy consumption.
- Energy saving lamps and ballasts will be specified in all lighting fixtures.

# Proposed Construction Documents Electrical Narrative

## **Electrical Distribution System:**

The main distribution panel (MDP) and all original Federal Pacific equipment will be replaced as they have reached the end of their expected useful life. Also, the replacement parts for this equipment can be expensive and/or difficult to obtain. The Square-D equipment appears to be in good condition and will be reused, where feasible.

The existing MDP is at maximum physical capacity, with no additional spares or spaces on the 1600A distribution section. The size of the electrical room is also a concern with regards to maintaining code required clearances. A new electrical service will be required in the building addition to accommodate the proposed construction phasing. The new service will be 480/277V with local dry type transformers to provide 208/120V service for receptacle and small appliance loads.

Surge protection will be provided for the service entrance, as well as cascaded surge protection devices on panelboards serving non-linear computer loads. Dedicated panelboards with 200 percent rated neutrals are recommended for this application. A separate neutral conductor is recommended to be installed for each computer circuit in order to reduce the effects of harmonics caused by non-linear loads.

## **Emergency Distribution System:**

The existing propane generator will be replaced with a new natural gas generator and automatic transfer switches. A dedicated transfer switch will serve code required life safety loads, such as egress lighting, fire alarm system, etc. A second transfer switch will serve optional standby loads. These will include the kitchen refrigerator/freezer, telecommunications equipment and boilers with associated pumps. Select circuits in the gymnasium, cafeteria, and kitchen areas will also be connected to the generator for use as a shelter, with heating and ventilation only (no air-conditioning).

## **Lighting:**

The existing lighting systems in the building will be replaced, largely due to physical condition. Lighting systems that meet adopted energy codes for lighting power density as well as controllability will be provided. Lighting controls will incorporate full automatic shutoff of building lighting systems via local vacancy detectors in classrooms and individual spaces and by contactors controlled via the building security system in the corridors.

Light Emitting Diode (LED) lighting will be provided at egress doors, connected to an emergency standby source per code and controlled via photocell. New LED pole mounted fixtures will also be provided to suit the new bus-loop and parking configuration. Exterior lighting served by a normal power source is proposed to be photocell enabled, controlled via the building management system or time clock. Photocells will be provided for individual fixtures.

### **Fire Alarm System:**

A new fire alarm system will be provided, per current HCPSS standards. The system will consist of manual pull stations, smoke detectors, heat detectors, sprinkler flow and tamper switches, as well as strobes and speakers for voice evacuation. A graphic annunciator panel will be located at the main entrance. An autodialer will be provided for communication of alarm to the local monitoring agency. The entire fire alarm system will be designed in accordance with the state of Maryland Fire Code, International Building Code, and National Fire Protection Association. All audible, visible, and initiating devices will be designed to meet ADA requirements.

### **Telecommunications System:**

The telecommunications system will be updated and replaced as required. The system shall meet current Maryland State and HCPSS standards. The system shall be star-wired and consist of category six cabling for both telephone and public address.

The data network infrastructure will be star-wired 1000 Base-T and consist of category six cabling. This infrastructure will provide all components for a complete operable Local Area Network (LAN). It will provide access to the system Wide Area Network (WAN) and Internet through T-1 access to the school system's data center. A multi-strand composite fiber optic backbone will be used to link the MDF with added Intermediate Distribution Frame (IDF) rooms. The IDF rooms will be strategically located to maintain 250 linear foot cable length limitations. The MDF and IDF rooms will be fully integrated with network switches that manage the distribution of data.

A secure, wireless infrastructure will be provided to ensure 100 percent connectivity throughout the building.

The quantity of integrated switches shall correspond with the sum total of network drops (outlets) and wireless access points.

Network outlets and associated category 6 cable will be provided in the following areas:

- Two (2) outlets at each office and administration area workstation/desk
- Two (2) outlets at each teacher workstation/desk
- One (1) outlet at each wall mounted projector, and two (2) beneath each projector (low drop)
- Four (4) outlets strategically located in each classroom to be used as required
- One (1) for each wireless access point necessary to saturate a surrounding field
- One (1) in other select areas for building maintenance and service requirements

Paging speakers will be provided in all corridors. All classrooms shall have voice handsets and speakers. Program clocks will be provided throughout. The existing public address (PA) and clock system will be expanded as required to accommodate devices in the new additions. The system shall be star-wired and consist of Category 6 cabling for both telephone and public address. Voice outlets will be terminated in dedicated patch panels to provide the ability to convert to voice over IP (VoIP) in the future if necessary.



Telephone outlets and cables will be provided in the following areas:

- Two (2) outlets at each office and administration suite work station/desk
- One (1) outlet at each teacher's workstation/desk
- One (1) outlet will in other selected areas
- One (1) dedicated outside line for the elevator cab emergency phone

Video drops will be provided in classrooms at each teacher wardrobe cabinet. CATV distribution will be interactive two-way distribution, consisting of broad-band coaxial cabling (RG-11u and RG-6u). All components reach as splitters and line amplifiers will be provided as required for integration into the existing building CATV system.

Epson short throw interactive projectors will be provided in each classroom and selected conference rooms. Inputs will include DVD/CATV from teacher wardrobes or cabinets, as well as VGA from each low outlet. An IR sensor will be provided in the ceiling over projector whiteboards for remote control of corresponding TV tuners and DVD players. Audio from input sources will be distributed within the classroom via four local ceiling mounted speakers to introduce quality sound throughout the classroom for students. A volume control will be located in each cabinet.

#### **Security System:**

New intrusion detection system, access control, and video surveillance systems will be provided per current HCPSS standards.

#### **Design Criteria:**

All systems and components will be designed in accordance with the following:

- Howard County Board of Education - Educational Specifications
- All applicable national, state, and local requirements
- Maryland State Interagency Committee for Public School Construction Standards
- Americans with Disabilities Act (ADA) Requirements
- American National Standards Institute (ANSI)
- Institute of Electrical & Electronic Engineers (IEEE)
- National Electrical Code (NEC)
- National Electrical Manufacturer's Association (NEMA)
- National Electrical Safety Code (NESC)
- National Fire Protection Association (NFPA)
- Underwriters Laboratories (UL)
- International Building Code (IBC)
- Illuminating Engineering Society (IES)
- American Society of Testing and Materials (ASTM)
- American Society of Mechanical Engineers (ASME)
- Maryland Public School Standards for Telecommunications Distribution Systems
- Maryland State Department of Education Technology Education Facility Guidelines

## Proposed Construction Documents Cost Estimate

	Schematic Design	Design Development	Construction Documents
Phasing & Temporary Facilities	<b>\$712,626</b>	<b>\$758,705</b>	<b>\$762,437</b>
Site Work	<b>\$1,492,254</b>	<b>\$1,651,724</b>	<b>\$1,671,411</b>
Additions	<b>\$3,929,267</b>	<b>\$3,946,960</b>	<b>\$3,826,022</b>
Renovations	<b>\$8,758,386</b>	<b>\$8,397,335</b>	<b>\$8,128,170</b>
<b>Total Base Bid</b>	<b>\$14,892,533</b>	<b>\$14,754,724</b>	<b>\$14,388,040</b>

Notes:

- Construction cost was prepared by the construction manager, Lend Lease Construction, and assumes that bids will be received in November 2013.
- Estimate includes a Construction Document phase contingency of 5 percent.
- Estimate assumes non-wage rate pricing (Add 8 percent for wage rate) .
- The estimate does not include a project contingency.