

Renovation and Additions to
Longfellow Elementary School

Schematic Design Report



HOWARD COUNTY PUBLIC SCHOOL SYSTEM

January 10, 2013



Smolen ■ Emr ■ Ilkovitch Architects office@seiarch.com

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Renovation and Additions to Longfellow Elementary School

FOR THE BOARD OF EDUCATION OF HOWARD COUNTY:

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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 Executive Director, Facilities Planning and Management
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

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 cafeterium 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 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 string music classrooms.

On September 20, 2012, the Howard County Public School System (HCPSS) staff presented a feasibility study for the Longfellow Elementary School project to the Howard County School System Board of Education. At this meeting, the board voted for the project to proceed as a renovation to the existing facility based on the Option #1 recommendation. A further request was made to have the staff investigate the possibility of relocating the school during construction versus a standard renovation while occupied.

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 s.f., but will strive to be 750 s.f. 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 Maryland State Department of Education (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 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 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 Leadership in Energy and Environmental Design (LEED) "certified" designation. This is to include an energy assessment on the existing facility and proposed design. Further information can be found on page 11.

Project Facts

Existing Building Square Footage:	56,458 GSF
Area of Demolition:	682 GSF
Area of New Additions:	12,081 GSF
<hr/>	
Proposed New Total Building Square Footage:	67,857 GSF

Project Schedule

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

Planning Advisory Committee Process

Information for the existing school was collected by the design team through site visits, discussions with the HCPSS staff, and review of record documents of previous facility modifications in order to verify the building layout and determine its physical conditions.

A Longfellow Elementary School Planning Advisory Committee was convened by the Superintendent of Schools to further investigate the needs of the school and provide input on the developing conceptual designs. The schematic design for Longfellow Elementary School was developed with the participation of the Longfellow Elementary School Planning Advisory Committee, Howard County Public School System staff, the design team, and community members. The committee meetings were held at Longfellow Elementary School with all the members previously listed.

The final concept design solution was a product of these meetings with discussions on a range of topics. Central to these discussions was the idea of achieving the needs of the county and school while remaining conscious of the project schedule and budget.

Topics of discussion for the Planning Advisory Committee Meetings included:

- Outlining the planning process with emphasis on a collaborative and discussion-based design process
- Understanding the functions of the existing school and the multitude of programs housed at this facility
- Establishing the basic relationships of the programs and individual spaces required
- Reviewing proposed site improvements to add to the functionality of the school
- Reviewing the constructability and economics of the concept with the construction manager present at the meetings
- Reviewing in detail the layout of the proposed concept plans
- Reviewing the general project schedule and timeline
- Reviewing preliminary site and building phasing plans for an occupied renovation
- Reviewing the direction to investigate an occupied renovation versus relocating the school

Smolen ■ Emr ■ Ilkovitch Architects wishes to sincerely thank the committee members, the Howard County Public School System, and all involved in the planning of this project for their active participation in the process.

"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.

The LEED process of this project is to include an initial "LEED workshop" to determine the specific credits the design team will incorporate into the design. TerraLogos will conduct the workshop in conjunction with the rest of the team. Once the LEED goals have been established, TerraLogos will continue to review the individual systems within the project's design to help guide the team towards the appropriate goals. As the process continues, the "working" LEED scorecard will be provided to identify the potential credits the project is striving to achieve.

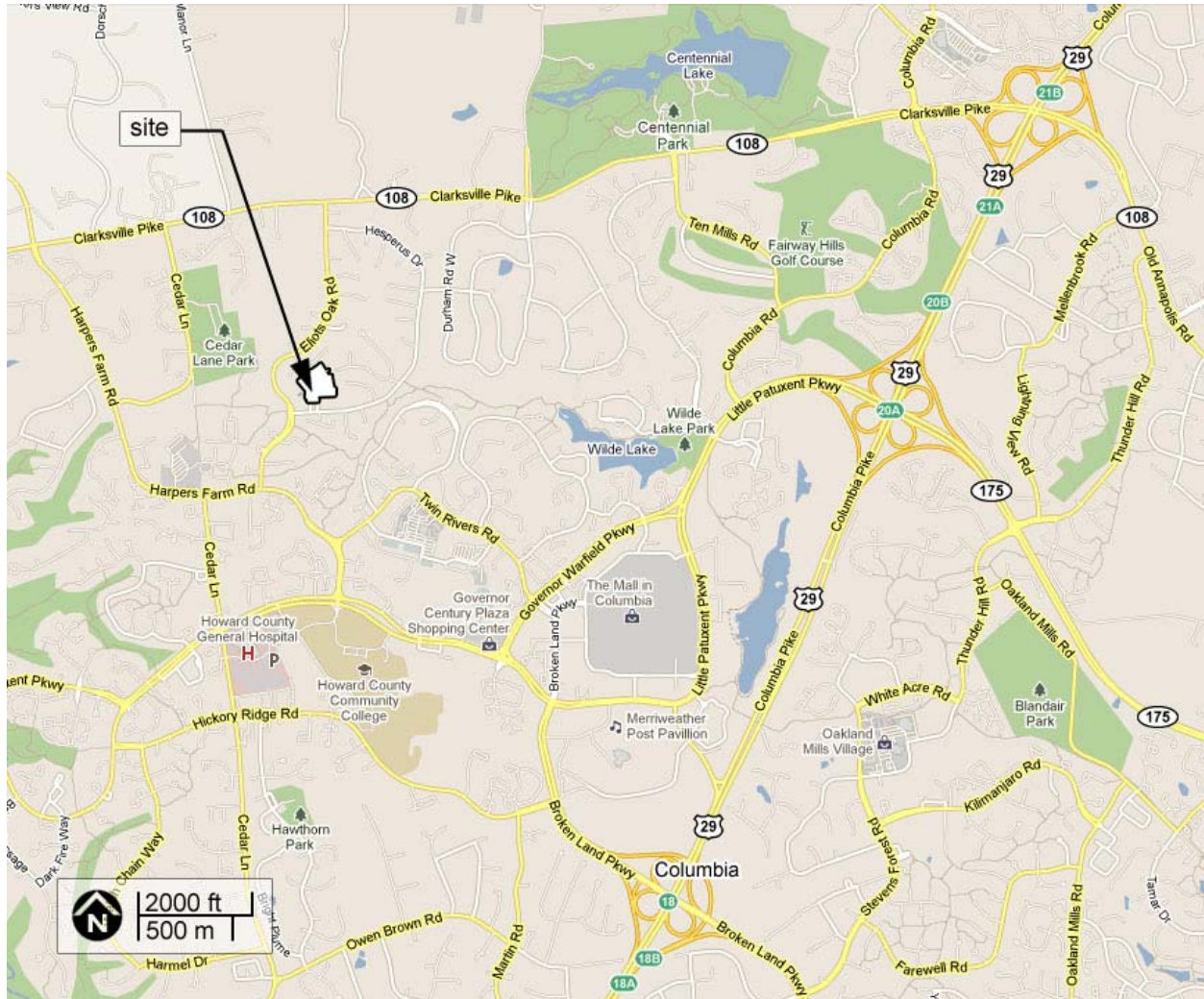
The following are examples of equipment, materials, and procedures that will be incorporated by the design team to provide a sustainable, energy efficient and healthy environment:

- *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 Heating, Ventilating and Air Conditioning (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.
- *CO₂ 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 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 houses 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 Schematic 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.



Proposed Site Plan








Existing Floor Plan Notes

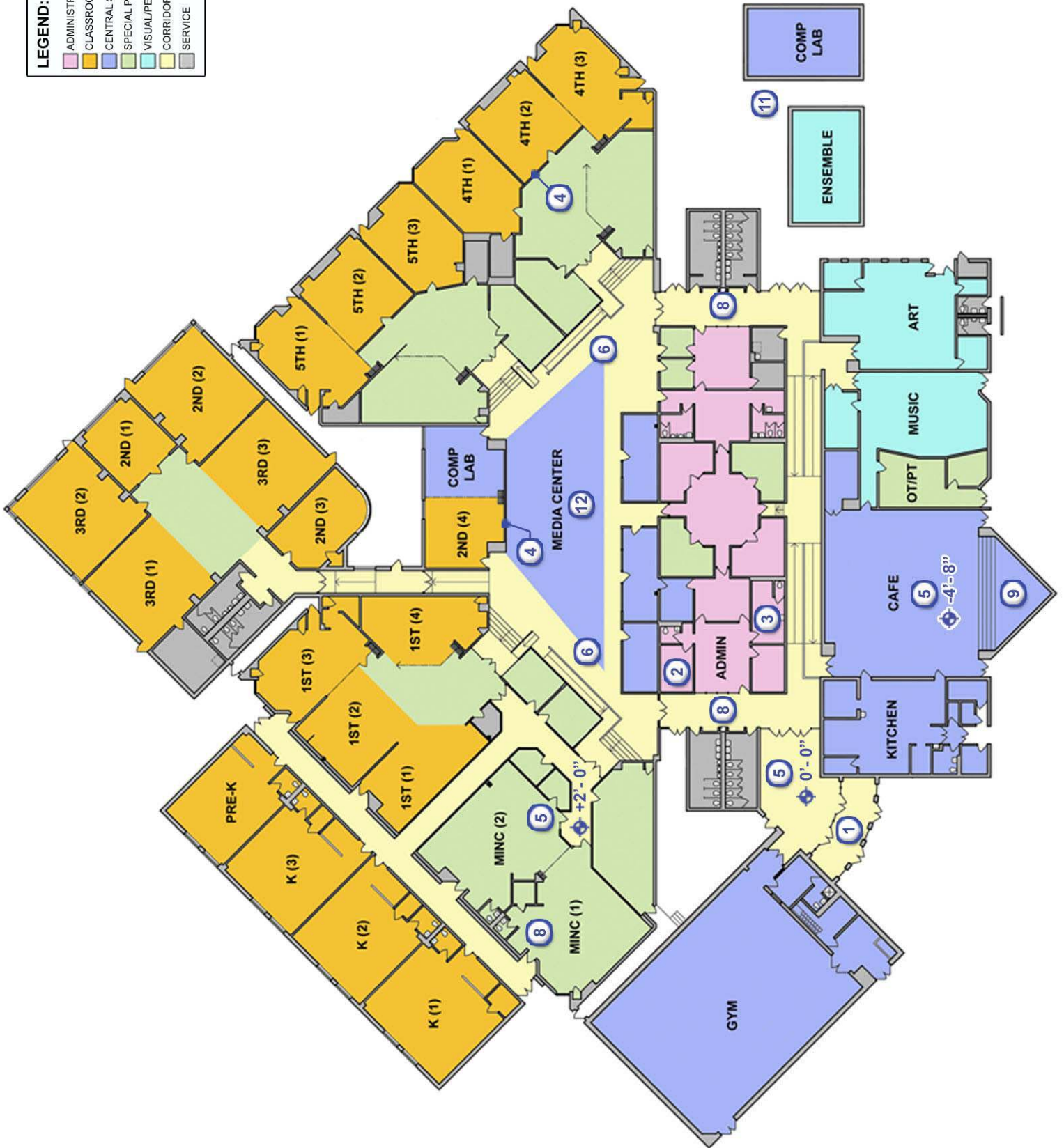
For the primary focus areas of this project, each department and support space has been color coded and indicated on the following floor plan graphics. These colors are maintained on the proposed floor plan graphic for easy reference of spaces between the two plans.

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 Schematic 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 inch 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 feet 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.
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.

Proposed Space Analysis

Proposed Net Areas

ACTIVITY / PROGRAM	AREAS	SF	TOTAL NET SF
		Total	50,182
ADMINISTRATIVE SPACES			
ADMINISTRATIVE AREA		Sub Total	1819
Reception	1	505	505
Conference Room	1	432	432
Principal Office (incl. toilet & closet)	1	261	261
Asst. Principal Office (incl. closet)	1	169	169
Testing Secure Storage	1	75	75
File Room	1	167	167
Staff Toilet	1	39	39
BSAP / FICO	1	171	171
TEACHER AREAS		Sub Total	866
Teacher Lounge	1	480	480
Teacher Work Room	1	386	386
GUIDANCE		Sub Total	261
Guidance Office	1	131	131
Psych. Office	1	130	130
HEALTH SUITE		Sub Total	688
Waiting Area	1	118	118
Office	1	120	120
Rest Area	1	153	153
Treatment Area	1	69	69
Exam Room	1	120	120
Toilet	1	39	39
Storage	1	69	69
CLASSROOM			
KINDERGARTEN		Sub Total	3873
Pre-K (incl. toilet & storage)	1	804	804
K-1 (incl. toilet & storage)	1	1119	1119
K-2 (incl. toilet & storage)	1	975	975
K-3 (incl. toilet & storage)	1	975	975
FIRST GRADE CLASSROOMS		Sub Total	3098
First Grade-1 (incl. toilet)	1	777	777
First Grade-2 (incl. toilet)	1	772	772
First Grade-3 (incl. toilet)	1	777	777
First Grade-4 (incl. toilet)	1	772	772

ACTIVITY / PROGRAM	AREAS	SF	TOTAL NET SF
SECOND GRADE CLASSROOMS		Sub Total	3154
Second Grade-1 (incl. toilet)	1	775	775
Second Grade-2 (incl. toilet)	1	775	775
Second Grade-3 (incl. toilet)	1	802	802
Second Grade-4 (incl. toilet)	1	802	802
THIRD GRADE CLASSROOMS		Sub Total	2465
Third Grade-1	1	757	757
Third Grade-2	1	854	854
Third Grade-3	1	854	854
FOURTH GRADE CLASSROOMS		Sub Total	2368
Fourth Grade-1	1	757	757
Fourth Grade-2	1	757	757
Fourth Grade-3	1	854	854
FIFTH GRADE CLASSROOMS		Sub Total	2465
Fifth Grade-1	1	854	854
Fifth Grade-2	1	757	757
Fifth Grade-3	1	854	854
CENTRAL SUPPORT SPACES			
CAFETORIUM		Sub Total	4351
Cafetorium	1	2311	2311
Stage	1	808	808
Storage	1	153	153
Kitchen	1	1079	1079
ESOL		Sub Total	154
ESOL Office	1	154	154
LIBRARY/MEDIA CENTER		Sub Total	4626
Media Center	1	2873	2873
Media Office	1	245	245
Media Prep	1	477	477
Technology Resource Room	1	802	802
Media Storage	2	115	229
COMPUTER ROOM		Sub Total	702
Computer Lab	1	702	702

ACTIVITY / PROGRAM	AREAS	SF	TOTAL NET SF
PHYSICAL EDUCATION		Sub Total	3818
Gymnasium	1	3314	3314
Storage	2	varies	332
PE Office (incl. toilet & closet)	1	172	172
VISUAL / PERFORMING ARTS			
MUSIC		Sub Total	2094
General Music Room (incl. storage)	1	1150	1150
Ensemble Room (incl. storage)	1	944	944
VISUAL ART		Sub Total	1024
Art Room	1	887	887
Kiln / Storage	1	137	137
SPECIAL PROGRAMS			
SPECIAL EDUCATION		Sub Total	2016
Special Education Room-1	1	148	148
Special Education Room-2	1	148	148
Special Education Room-3	1	239	239
Special Education Room-4	1	255	255
OT/PT	1	516	516
Speech	1	140	140
Alternate Education Office	1	570	570
MULTIPLE INTENSE NEEDS CLASSES (MINC)		Sub Total	1764
MINC-1 (incl. toilet)	1	886	886
MINC-2 (incl. toilet)	1	878	878
EXTENDED LEARNING ROOM		Sub Total	1724
ELR-1	1	361	361
ELR-2	1	703	703
ELR-3	1	361	361
ELR-4	1	299	299
GIFTED & TALENTED CLASSROOMS		Sub Total	1487
Gifted & Talented Classroom-1	1	779	779
Gifted & Talented Classroom-2	1	708	708

ACTIVITY / PROGRAM	AREAS	SF	TOTAL NET SF
READING RESOURCES		Sub Total	834
Reading Room	1	251	251
Reading Meeting Room	1	262	262
Reading Room	2	77	154
Reading Closet	1	167	167
MATH RESOURCES		Sub Total	460
MST / Title I Room	1	272	272
Math Closet	1	188	188
BUILDING SERVICES			
GENERAL STORAGE AREAS		Sub Total	952
Storage Areas	11	varies	952
CUSTODIAL AREAS		Sub Total	1883
Custodial Office	1	214	214
Custodial Closets	1	116	116
Boys Toilets (varies in size)	4	varies	642
Girls Toilets (varies in size)	4	varies	642
Adult Toilets	6	varies	269
DATA ROOMS		Sub Total	197
MDF Room	1	122	122
IDF Rooms	2	varies	75
MECHANICAL / ELECTRICAL ROOMS		Sub Total	1039
Mechanical Room	1	489	903
Electrical Rooms	2	varies	136

Proposed Schematic Mechanical Narrative

Base Recommendation:

The existing HVAC equipment and systems are beyond their useful life expectancies and are recommended to be replaced in their entirety with the possible exception of the 2008 kindergarten addition. Recommendations include utilizing higher 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, it is recommended that all supply and return duct systems be replaced (with the exception of the 2008 kindergarten addition) to match the optional 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 ASHRAE requirements. This will also increase the required cooling capacity and associated power requirements.

It is recommended to utilize 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 terminal control units (VAV), equipped with hot water heat coils. A small heating plant utilizing variable flow condensing type gas fired boilers is recommended. Based on the limited infrastructure space, an all-air type system such as this will require lower ceiling and/or bulkheads.

Geothermal Alternative:

A geothermal heat pump system with heat recovery ventilation was examined as an alternative HVAC system. Investigation found the geothermal alternative unfeasible due to the limited acreage, extreme grading, and underground storm water management requirements of the Longfellow Elementary School site.

Automatic Temperature Control:

It is recommended that the building be provided with an upgraded Web-Based Automation System and be tied into the county Energy Management System. It is recommended that the system have full direct digital controls. All controls shall be electric/electronic actuation. All control and monitoring points shall be consistent with the County's current standards.

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

The Basic Design Criteria is 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 3" water service, which extends into the building, shall be replaced with a 4" distribution system. Backflow preventers and vacuum breakers will be provided to prevent back siphonage and contamination of the potable water system. The water piping shall be sized per the requirements of the American Society of Plumbing Engineers and the International Plumbing Code.

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 and serve the fixtures and equipment as required. All domestic water piping shall 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.

Freeze-proof wall hydrants will be located every 150 feet along the building's perimeter.

The existing under-slab sanitary mains shall be reused to the fullest extent possible. The new renovation/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 International Plumbing Code. New piping systems (cold water, hot water and hot water circulating) will be provided. New plumbing systems will be installed in strict accord with all applicable codes and regulations, including ADA.

The existing storm water collection system at the renovation/addition area will be modified as required and will serve the addition(s). A new storm water drain line will be brought to a point 5'-0" from the building exterior wall (under another Division). At this point, and under this Division, 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 International Plumbing Code.

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 Schematic Electrical Narrative

Electrical Distribution System:

Up to date load information on the building was not available at the time of report to determine if the ampacity of the equipment has been reached. The service is anticipated to be adequate for any of the proposed upgrades, based on a volt-amperes per square foot estimate at a maximum 65,518 gsf. However, it is recommended that the main distribution panel (MDP) and all original Federal Pacific equipment 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 for its age, although thermal imaging is recommended to adequately determine this.

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. The replacement switchboard is recommended to be reconfigured to serve new distribution panelboards located strategically in the building. These will serve lighting and appliance panelboards, rather than the MDP.

Surge protection is recommended for the incoming 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 generator and automatic transfer switch have not reached their anticipated useful life of 25-30 years old. These can be reused to serve life safety loads in the building. A second generator, or larger replacement generator, and additional automatic transfer switch would be required to serve additional optional standby loads that are commonly on standby power in schools. These loads include the kitchen refrigerator/freezer, telecommunications equipment and/or select HVAC equipment.

Lighting:

The existing lighting systems in the building are recommended to be replaced, largely due to physical condition. Lighting systems that meet adopted energy codes for lighting power density as well as controllability are recommended. Lighting controls will be required to incorporate full automatic shutoff of building lighting systems. This can be accomplished via local vacancy detectors or via contactors controlled via the building energy management control system (EMCS) with timed, local override.

Compact fluorescent lighting is recommended at egress doors, connected to an emergency standby source per code and controlled via photocell. Exterior lighting served by a normal

power source is proposed to be photocell enabled, controlled via the building management system or time clock.

Fire Alarm System:

A new Fire Alarm System is recommended, per current HCPSS standards. The system will consist of manual pull stations, smoke detectors, heat detectors, sprinkler flow and tamper switches, as well as horns and strobes. A graphic annunciator panel will be located at the main building entrance. An autodialer will be provided for communication of fire alarms 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 (IBC), and National Fire Protection Agency (NFPA). All audible, visible, and initiating devices will be designed to meet ADA requirements.

Telecommunications System:

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

The data network will be star-wired 1000 Base-T and consist of category six cabling. The system 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 access through T-1 access to a county server site. A multi-strand composite fiber optic backbone will be used to link the main distribution frame (MDF) with intermediate distribution frame (IDF) rooms. IDF rooms will be added and strategically located telecommunication hubs (IDF Rooms) are recommended to limit cabling lengths to 250 linear feet.

A new public address system is recommended, including a new local system for the multipurpose room, tied into the building public address system.

Security System:

The intrusion detection system, access control and video surveillance systems may be reused, with new wiring and devices as required to suit revised space configurations.

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 (NEESC)
- 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 Schematic Cost Estimate

Phasing & Temporary Facilities	\$712,626
Site Work	\$1,492,254
Additions	\$3,929,267
Renovations	\$8,758,386
<hr/>	
Total Base Bid	\$14,892,533

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 schematic design phase contingency of 8%.
- Estimate assumes non-wage rate pricing (Add 8% for wage rate).
- The estimate does not include a project contingency.

Appendix A: Occupied Renovation/School Relocation Study

Background

At the September 20, 2012, Board of Education presentation for the Longfellow Elementary School Feasibility Study, the Board requested for the design team to provide an investigation into the possibilities of relocating the students during the proposed Longfellow Elementary School renovation. The purpose of this investigation was to determine the feasibility of such an option, the receptiveness of the school community for relocation, as well as the implications on project cost and scheduling. Dayton Oaks Elementary School and Clarksville Elementary School were investigated as potential relocation sites, as both currently have excess capacity. The following narrative is a brief discussion of this investigation.

The Howard County Public School System typically utilizes occupied renovations for projects of this scope and magnitude. In an occupied renovation the construction is divided into phases and is worked out with school staff. These phases allow the construction to shift around the building to allow the school to remain open and completely functional throughout the duration of the project.

Student Relocation Alternatives

The design team's investigation examined the potential of Clarksville Elementary School and Dayton Oaks Elementary School to house Longfellow Elementary School students. At each site, modular and portable classroom buildings would be located onto playing fields to accommodate the relocated students. Proposed counts and locations of the modular and portable classroom buildings are shown on the following graphics.

Clarksville Elementary School:

The investigation found the core facilities at Clarksville Elementary School inadequate to handle the increased population. The primary items of concern include the size of the cafeteria and bus loop. Additionally, to relocate to Clarksville Elementary School, the entire population of Longfellow Elementary School would be housed within temporary instruction spaces located on the school's ball fields. This option greatly reduces the play area for both schools.

Dayton Oaks Elementary School:

The only adequate location for relocatables at Dayton Oaks Elementary School lies on adjacent playfields. These relocatables would end up being more than 1,000 feet from the school building. Another complication is that these playfields are on land owned by Howard County Recreation and Parks (HCRP). Locating on this site would entail some waste water treatment plant permit limitations. The investigation also revealed Dayton Oaks Elementary School to be located rather far from Longfellow Elementary School. The bus travel distance time between the two schools is 35 to 50 minutes. Considering all the factors, the staff estimates the costs of relocating Longfellow Elementary School to Dayton Oaks Elementary School to be approximately \$2.8 million, offset partially by construction savings.

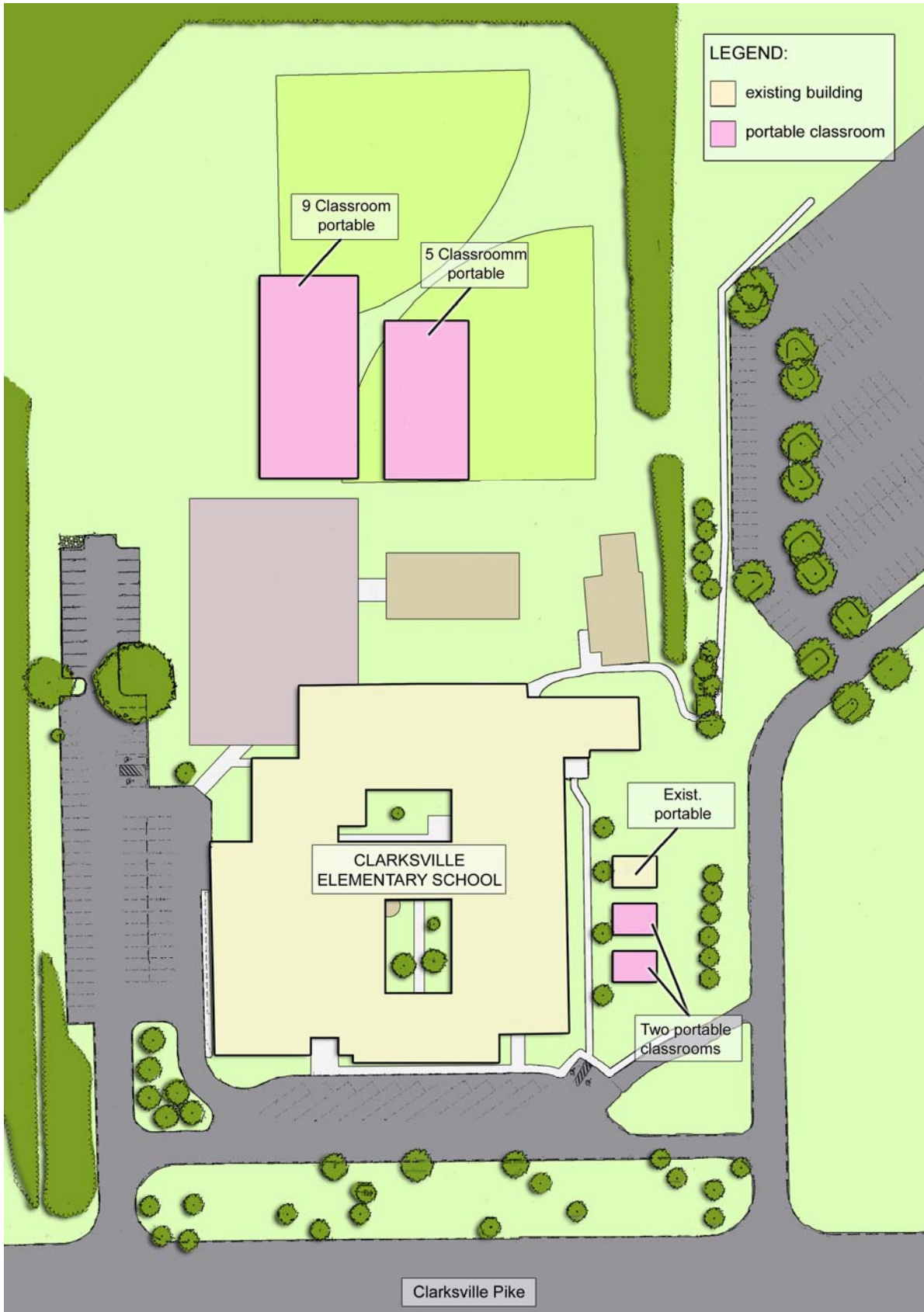
Community Concerns

During the schematic design phase, the HCPSS staff and the design team discussed the potential for staff and student relocation with the members of the Planning Advisory Committee (PAC), which included both community members and staff. The PAC, as representatives of the greater school community, presented concerns with relocating the school, the following is a sample of these concerns:

- Potential changes to or loss of Title I status and differentiated staffing (i.e. Alternative Education, Reading Recovery, MST, RST).
- What would happen to all staff members? How would they be divided if the school were to be separated between multiple facilities? Would they remain Longfellow Elementary School staff and automatically return to Longfellow Elementary School when the renovation is complete?
- Accountability issue concerns. Would scores be incorporated into the new schools or would the scores of Longfellow Elementary School students be pulled out separately?
- Managing the use of common areas could be an issue (cafetorium for lunches and other school related activities; a common place for staff meetings, and the related arts space could also be a problem).
- How will we assist parents who do not have transportation?
- The K-2 grades (at least K and Grade 1) Longfellow Elementary School student classes would be in the building, potentially requiring some Dayton Oaks Elementary School students to be housed in relocatables. How will Dayton Oaks Elementary School parents respond?

Recommendation

The HCPSS staff recommends conducting a phased renovation with students and staff on site. The investigation has found that while there is space to hold the Longfellow Elementary School student population on the sites of Dayton Oaks Elementary School and Clarksville Elementary School, these schools may not be able to support a proper learning environment for such students. The difficulties and distractions involved in relocating the school population appear to be more detrimental than those involved in an occupied renovation.



Proposed relocation scheme at Clarksville Elementary School



Proposed relocation scheme at Dayton Oaks Elementary School