



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

TITLE: Laurel Woods Elementary School Construction Document Report **DATE:** February 25, 2014

PRESENTER(S): Bruce Gist, Director, School Construction

Tom Terranova, Project Manager, Colimore Architects

OVERVIEW:

The attached construction document brochure describes the proposed additions to Laurel Woods Elementary School. Laurel Woods Elementary School opened in 1973 and was expanded with building additions in 1987 and 2008. Systemic renovations and modernizations of the interior spaces, including a complete roof replacement, were completed in 2004 and 2005 respectively.

Due to the increase in student population, as well as the need for reallocated program spaces inside of the school, a two-story classroom addition was agreed upon. The addition includes an art and music room that will increase the classroom capacity by 100 seats along with a cafetorium expansion. A physical education activity room, new direct digital control HVAC control system, and a modification of the kitchen area have been designed and will be bid as project alternates.

The following updates have taken place since the design development report. The design team has enlarged the existing art room which is to be converted to a pre-kindergarten classroom including renovations to the adjacent toilet rooms; the addition was raised by 8" to accommodate existing utility demands; skylights were added to classrooms adjacent to the two-story addition for natural light; and the dumpster enclosure was relocated. Due to the Maryland Emergency Management Agency mandate, the existing and new electrical systems were modified to accommodate the state's emergency shelter requirements.

RECOMMENDATION/FUTURE DIRECTION:

It is recommended that the construction document report for Laurel Woods Elementary School be approved as submitted.

**Submitted
by:**

Bruce Gist
Director, School Construction

**Approval/
Concurrence:**

Renee A. Foose, Ed.D.
Superintendent

Susan C. Mascaro
Chief of Staff

Ken Roey
Chief Facilities Officer

ADDITIONS and RENOVATIONS to LAUREL WOODS ELEMENTARY SCHOOL

FOR

HOWARD COUNTY PUBLIC SCHOOL SYSTEM



CONSTRUCTION DOCUMENTS REPORT

FEBRUARY 25, 2014

Colimore Architects, Inc.
1240 Key Highway
Baltimore, Maryland 21230
410-752-3720



COLIMORE | ARCHITECTS
INCORPORATED

Construction Document Report

Additions and Renovations to Laurel Woods Elementary School

FOR THE BOARD OF EDUCATION OF HOWARD COUNTY

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Director School Construction	Bruce Gist

February 25, 2014

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Planning Advisory Committee

Planning Committee

Susan Brown	Laurel Woods Elementary School, Principal
Rhonda Inskeep	Laurel Woods Elementary School, Assistant Principal
Debbie Gaeng	Laurel Woods Elementary School, Teacher
Janet Yarn	Laurel Woods Elementary School, Teacher
Assunta Vitiello	Laurel Woods Elementary School, Teacher
Judy Wolf	Laurel Woods Elementary School, Principal Secretary
Emily Goudreau	Laurel Woods Elementary School, Teacher
Susie Vitiello	Laurel Woods Elementary School, Teacher
Andrew Ashby	Laurel Woods Elementary School, Teacher
Joshua Griffin	Laurel Woods Elementary School, Teacher
Amanda Faudale	Laurel Woods Elementary School, Teacher
Sarah McGuire	Laurel Woods Elementary School, Teacher
Kelly Miller	Laurel Woods Elementary School PTA, Parent
Julie Brown	Laurel Woods Elementary School PTA, Parent
Scott Washington	Howard County Public School System (HCPSS) Manager of Design and Preconstruction Services, School Construction
Bruce Gist	HCPSS, Director of School Construction
Dan Keiser	HCPSS, Program Manager, School Construction
David Ramsay	HCPSS, Director of Transportation
Marcy Hersl	HCPSS, Assistant/Risk Analyst
Jennifer Bubenko	HCPSS, Planning Specialist
Ken Roey	HCPSS, Chief Facilities Officer
Betsy Zentz	HCPSS, Interagency Specialist
Wayne Crosby	HCPSS, Director of School Facilities
Todd Holmes	Howard County Department of Recreation and Parks, Program Coordinator
Matt Madera	Howard County Department of Recreation and Parks, Facility Director
Raul Delerme	Howard County Department of Recreation and Parks, Bureau Chief
Gloria Mikolajczyk	Maryland State Department of Education – School Facilities, Architectural Supervisor

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Colimore Architects Inc., Project Manager

Design Team

Owner

Howard County Public School System Ellicott City, MD

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Colimore Architects Inc. Baltimore, MD

Civil Engineer

Fisher, Collins & Carter Inc. Ellicott City, MD

Structural Engineer

Columbia Engineers Inc. Columbia, MD

Mechanical Engineer

Burdette, Koehler, Murphy
and Associates, Inc. Baltimore, MD

Electrical Engineer

Burdette, Koehler, Murphy
and Associates, Inc. Baltimore, MD

Information Technologies

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HCPSS, Leadman, Electrical Department

Todd McMahon

HCPSS, Project Management Specialist

Al Mullinix

HCPSS, Hardware

Jon Naill

HCPSS, Leadman, Painting/Flooring

Larry O'Neill

HCPSS, Building Services, Life Safety

Andy Stanco

HCPSS, Building Services

Reny Toledo

HCPSS, Assistant Manager, Audio Visual Services

Robert White

HCPSS, Custodial

Continuation of the School Design Process

This construction documents (CD) report is intended to describe changes to the design and project scope for the additions and renovations to Laurel Woods Elementary School that have occurred since submission of the design development report. Project facts have been updated and a revised cost estimate is included that reflects the additional detail developed during this phase.

The planning process for Laurel Woods 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 August 15, 2013.

Following approval of the schematic design report, a formal schematic design submittal was sent to the Maryland State Department of Education (MSDE) and approved by them for the continuation of the design process on September 5, 2013.

Coordination meetings with the faculty and staff of the school during the design development phase resulted in adjustments to the site and building plans as described in the design development report. These modifications were presented to and approved by the HCPSS Board of Education on October 22, 2013.

Following approval of the design development report, a formal design development submittal was prepared for the MSDE and approved by them for continuation of the design process on December 16, 2013.

Noteworthy changes to the project since the design development approval are summarized below:

1. The new pre-K classroom at the site of the existing art room has been enlarged and includes renovation of two adjacent toilet rooms.
2. A meeting was held with county fire and building code officials to review life safety aspects of the project. Preliminary approval was given for the general building and site layout.
3. The need to raise the classroom addition by 8" to accommodate the existing sanitary invert was confirmed through additional field investigations.
4. Options for adding a second serving line to the kitchen were studied. The selected scheme is included as an add-alternate.
5. At the request of facilities staff, the existing boiler room was reconfigured to accommodate a magnetic bearing chiller. A transformer was added to the boiler room to provide the 480 volt service needed for the requested chiller.
6. Tubular skylights were added to each of the four existing classrooms near the

- proposed two-story addition to compensate for the loss of exterior windows.
7. The dumpster enclosure was relocated away from the front of the building and out of view from the parking lot loop drive.
 8. The new and existing electrical systems were modified to accommodate emergency shelter requirements outlined in a letter from the Maryland Emergency Management Agency (MEMA) dated December 30, 2013.
 9. Phasing plans were developed to facilitate the safe operation of the school throughout construction.
 10. The project schedule on page 9 has been updated to indicate completed phases.
 11. The proposed space analysis on page 24 has been updated with CD phase square footage totals.
 12. The construction cost estimate on page 37 has been updated by the construction manager for the CD phase.

At the request of the Board, the design team looked at the feasibility of re-designing the parking lot to increase the number of available parking spaces. A preliminary plan was developed and included in the design development report. The plan provided a net increase of 23 parking spaces. The extent of site work involved and the anticipated construction costs were considered excessive for the resulting additional parking capacity. Parking lot revisions as described in the previous report are excluded from the current scope of this project.

Project Description

Laurel Woods Elementary School is a single-story masonry structure, Type IIB construction (noncombustible/unprotected) that opened in 1973. The building was expanded with subsequent building additions in 1987 and 2008. The building underwent further renovations in 2004 and the roof was replaced in 2005. Currently there are six (6) portable classrooms located in the front and rear of the school. The building is in good condition with no identified structural deficiencies. The building is one story with egress directly onto grade around the building. The student enrollment, as of May, 2013, is 564 students. The population of the school is continuing to grow, making the need for the expanded space necessary in order to keep pace with the programmatic requirements of the HCPSS.

The school currently has need of the following, which were considered during project design:

- Eight (8) new classrooms
- Dedicated music room
- Dedicated art room
- Restrooms and storage
- New physical education activity room (Add-Alternate Number 1)
- Expanded cafeteria
- New secure entrance
- Increased mechanical and electrical infrastructure as needed to support additional spaces

In addition to the above, the school wishes to maintain portable classroom units at the front of the building and remove those at the rear to provide space for the reorganization of the existing outdoor recreational areas.

The proposed classroom addition will be two-stories with two stair towers providing direct egress from the building. New security doors will be provided inside the existing entry doors to create a secure vestibule visible from the main office. Entry after normal opening hours will be remotely controlled by office personnel.

An emergency vehicle access lane will be extended around the south and east sides of the building to the proposed classroom addition. This will also be used as access during construction.

Project Sustainable Intent

The design of these additional spaces will be in accordance with 'Green' practices. The addition and renovated spaces will be reviewed for energy conservation.

The existing energy star rating of the building will be documented. Proposed improvements and/or upgrades necessary to improve by 20 percent will be identified.

The goal of incorporating sustainability practices where it also encourages learning experiences will be a focus of the design.

Project Facts

	SD	DD	CD
Existing Building Gross Square Footage:	55,000	55,000	55,000
Gross Square Footage of New Additions:	16,500	16,556	16,248
Gross Square Footage of Add-Alternates:	2,000	1,892	1,985
New Total Building Gross Square Footage:	73,500	73,448	73,233

Project Schedule

Planning Meetings Completed	June 28, 2013
Schematic Design Presented to Board of Education For Review and Approval	August 15, 2013
Schematic Design Submission to IAC For Review and Approval	August 15, 2013
Design Development Submission to Board of Education For Review and Approval	October 22, 2013
Design Development Submission to IAC For Review and Approval	October 24, 2013
Construction Documents Submission to Board of Education For Review and Approval	February 25, 2014
Construction Documents Submission to IAC For Review and Approval	March 4, 2014
Project out for Bids (3 weeks)	April 2014
Bids Received	May 2014
Construction Begins	July 2014
Construction Completed	August 2015

Planning Process

The proposed additions are in response to programmatic needs of the school as outlined by representatives of the HCPSS. Preliminary design exercises quickly identified the challenges presented by the confines of the site and configuration of the existing floor plan. The existing building, portable classroom units and outdoor recreational areas are tightly locked between steep slopes and a parking area already at capacity. Adding to the existing floor plan in a way that will coordinate with the existing circulation pathways will require substantial site grading and reconfiguration of outdoor spaces.

The location selected for the classroom addition will require the least amount of site work compared to other options studied while providing easier access for emergency vehicles. The proposed two-story addition further reduces the required site work while minimizing the impact on the surrounding outdoor areas.

Prior to presenting this initial design concept to committee members for consideration and comment, it was reviewed by civil consultants, Fisher, Collins and Carter for feasibility of construction with respect to site work, grading and stormwater management.

A series of schematic design review meetings were held at the school, each well attended by members of the Planning Advisory Committee. Comments and direction from committee members throughout the course of these meetings were vital in developing the design of the various additions and site.

The design process is outlined below:

- Scope of design provided by the HCPSS
- Preliminary plan developed based on the schools existing floor plan, footprint, site constraints, and input from the HCPSS
- First of three committee meetings in June 2013 – comments were received, documented and incorporated into the preliminary plan
- Second committee meeting – presented revised plan incorporating agreed upon comments from the first committee meeting. Additional comments were received, documented, and incorporated into the preliminary plan
- Plans further developed based on third committee meeting
- A review with the appropriate staff was conducted to further refine the design of each space.

With the involvement of the committee during the June meetings, the design quickly evolved into a viable schematic plan that meets the needs of the school. During design development, input from facilities staff was incorporated to provide much needed

systemic upgrades to the school. In the construction documents phase, additional input was received from facilities staff, school administrators and county and state officials. The present design has evolved to address each of the critical concerns expressed by these groups while maintaining sensitivity to the following core issues:

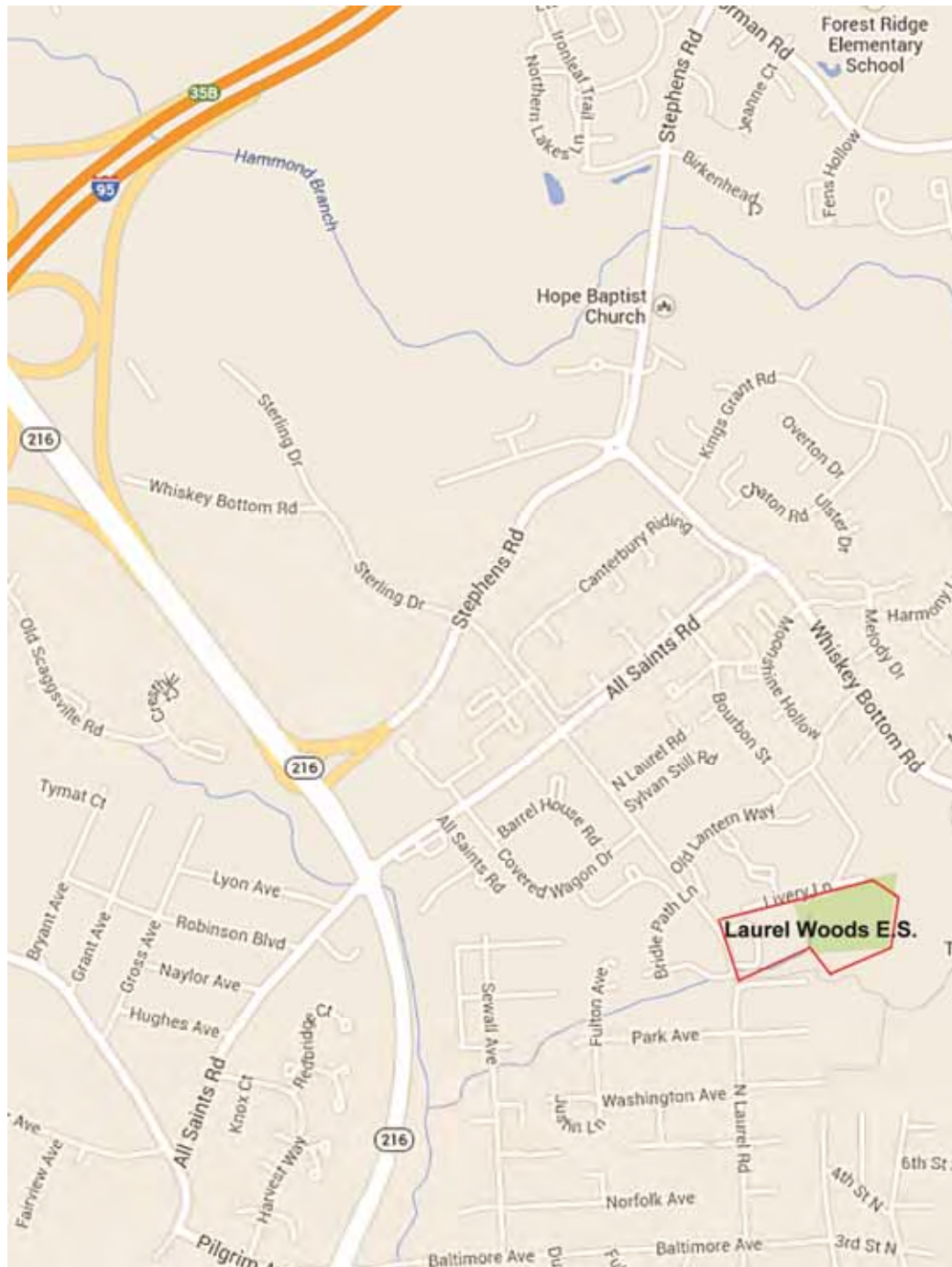
- Budget
- Sustainability of design, construction and operation
- Existing building infrastructure
- Communication of existing spaces with proposed additions
- Construction impact on the school while in session
- Safety throughout construction

J. Vinton Schafer & Sons, Inc. has been involved in the design process from the beginning, providing input on constructability, phasing, and budget considerations. Their involvement will help us achieve an efficient design and construction sequence that will deliver the finished additions on time and within budget.

Vicinity Map

Laurel Woods Elementary School is located off North Laurel Road. The school is situated on a 11.5-acre site surrounded by forest and residential developments. It is located about a mile south of Forest Ridge Elementary School.

Public water, sewer, and natural gas serve the site.



Laurel Woods Elementary School – CD Report



Existing Site Constraints

Laurel Woods Elementary School is situated on a challenging site, with steep slopes on three sides. The proposed additions will necessitate substantial reworking of existing site grades as shown in the site plan on page 16. Outdoor spaces for recreation are also limited. The proposed design has relocated all outdoor play areas affected by the new construction.

Site & Building Plan Notes

Key features of the proposed site and building modifications are listed below and identified with circled numbers on the proposed site plan on page 16.

1. Location of two-story classroom addition – See enlarged plans on page 19.
2. Location of cafetorium addition – See enlarged plan on page 20.
3. Location of new secure entry vestibule – See enlarged plan on page 21.
4. Location of a proposed emergency access lane/ construction access road.
5. Reconfigured macadam play areas.
6. Relocated asphalt courts.
7. Relocated rubberized play area.
8. New accessible ramp to ball fields.
9. Location of P.E. activities room – Add-Alternate Number 1 – See enlarged plan on page 22.
10. New fire hydrant required by county officials.
11. New emergency generator.
12. Stormwater management pond.

Construction Documents Site Plan Revisions:

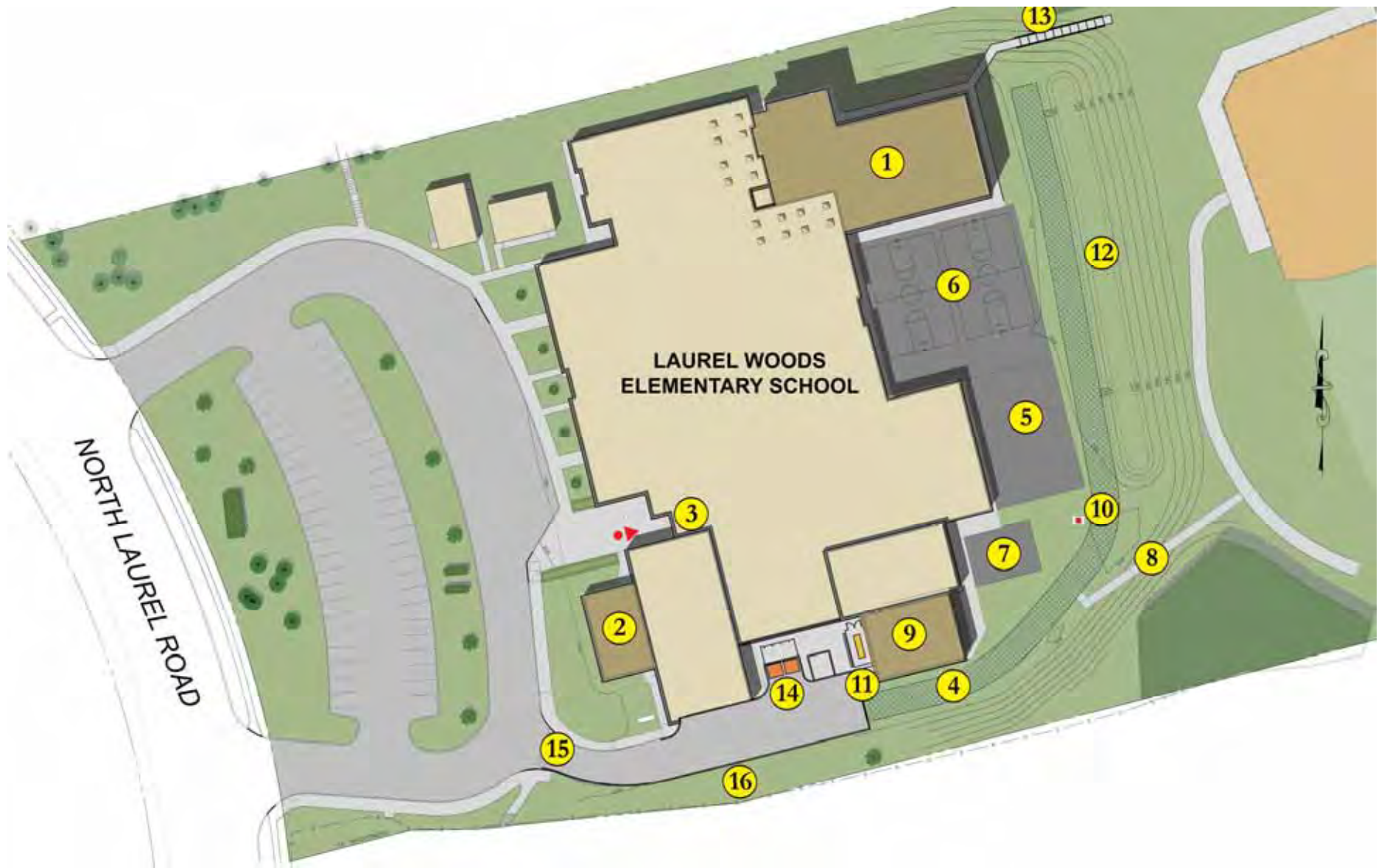
Updated features of the proposed site plan are listed below:

13. New site stairs to ball fields.
14. Relocated dumpster pad.
15. Reduced paving modifications at the entrance to the service road.
16. Additional grading at the south end of the site to increase clearance for service vehicles.

Construction Documents Building Plan Revisions:

Updated features of the proposed building plan are listed below.

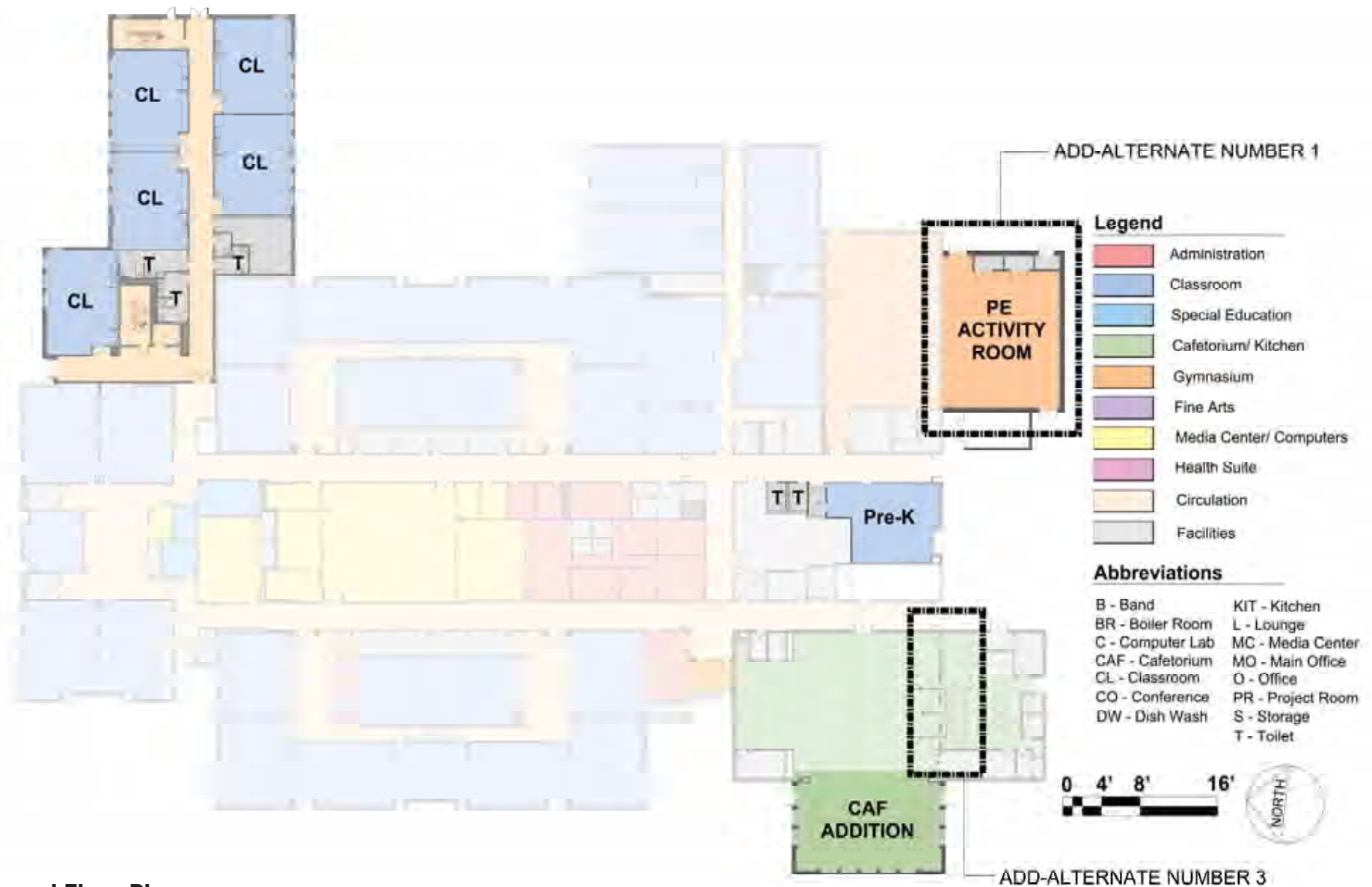
1. Floor plans have been adjusted to facilitate construction and placement of furnishings.
2. Two existing toilet rooms adjacent the proposed pre-K classroom have been added to the scope of the renovation. One will be converted to serve as the pre-K toilet room, allowing a significant increase in the classroom area. The other is being converted to two individual toilet rooms for faculty use. See the enlarged plan on page 23.
3. Add-Alternate Number 3 has been developed to increase the serving capacity of the kitchen with minimal new construction. See the enlarge plan on page 20.



Proposed Site Plan



Existing Floor Plan



Proposed Floor Plan



First Floor

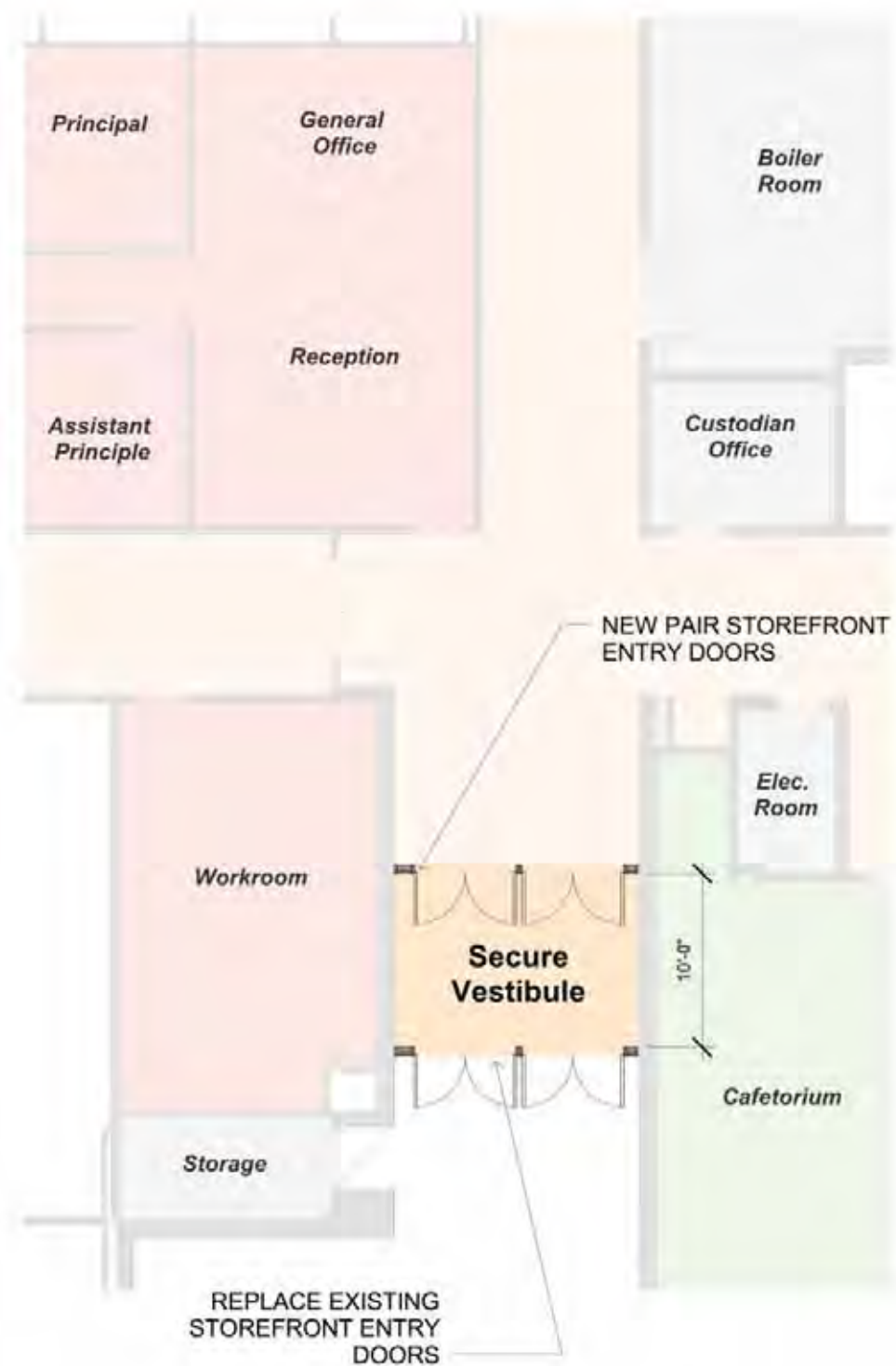


Second Floor

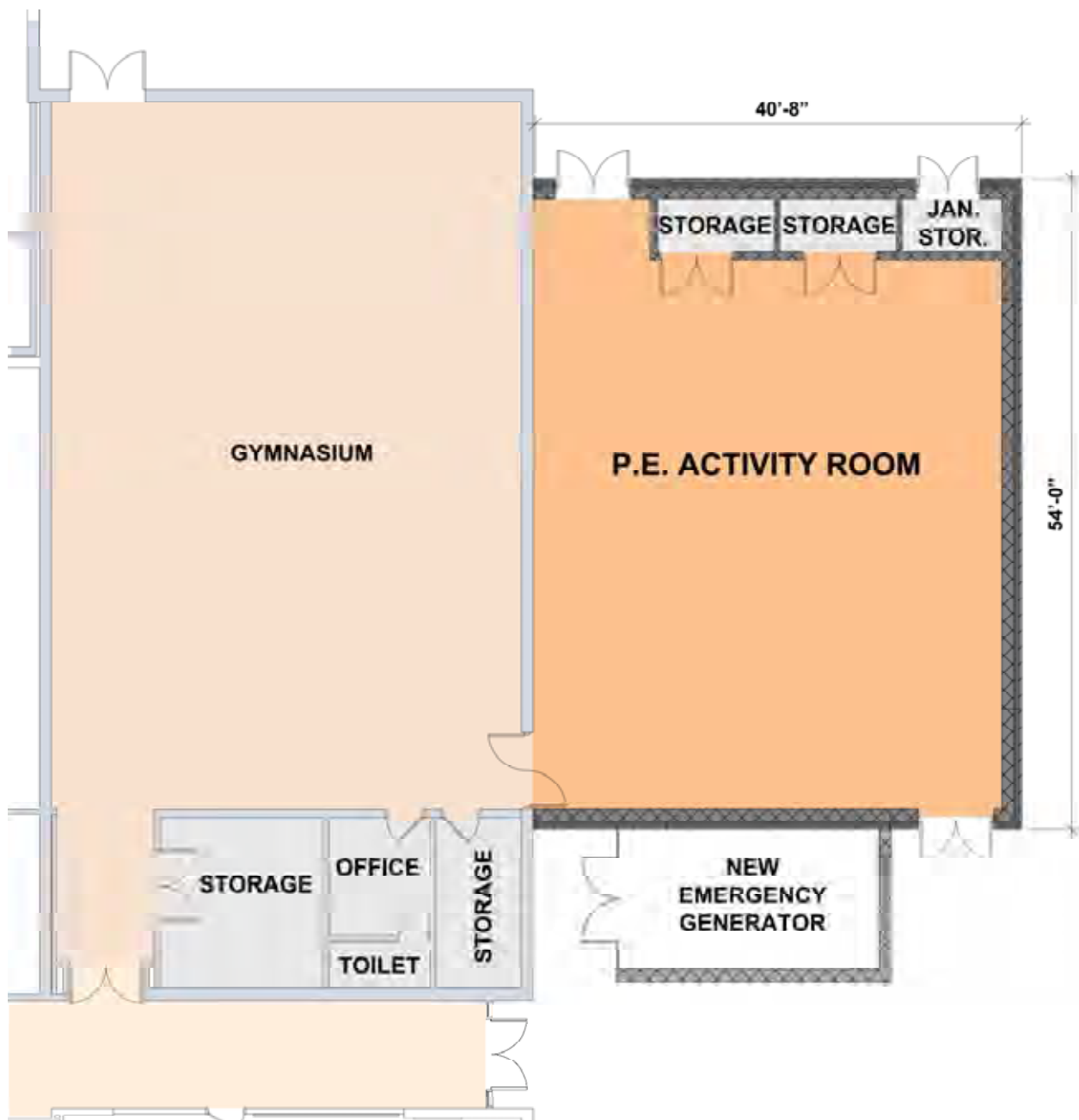
Enlarged Plans at Proposed Classroom Addition



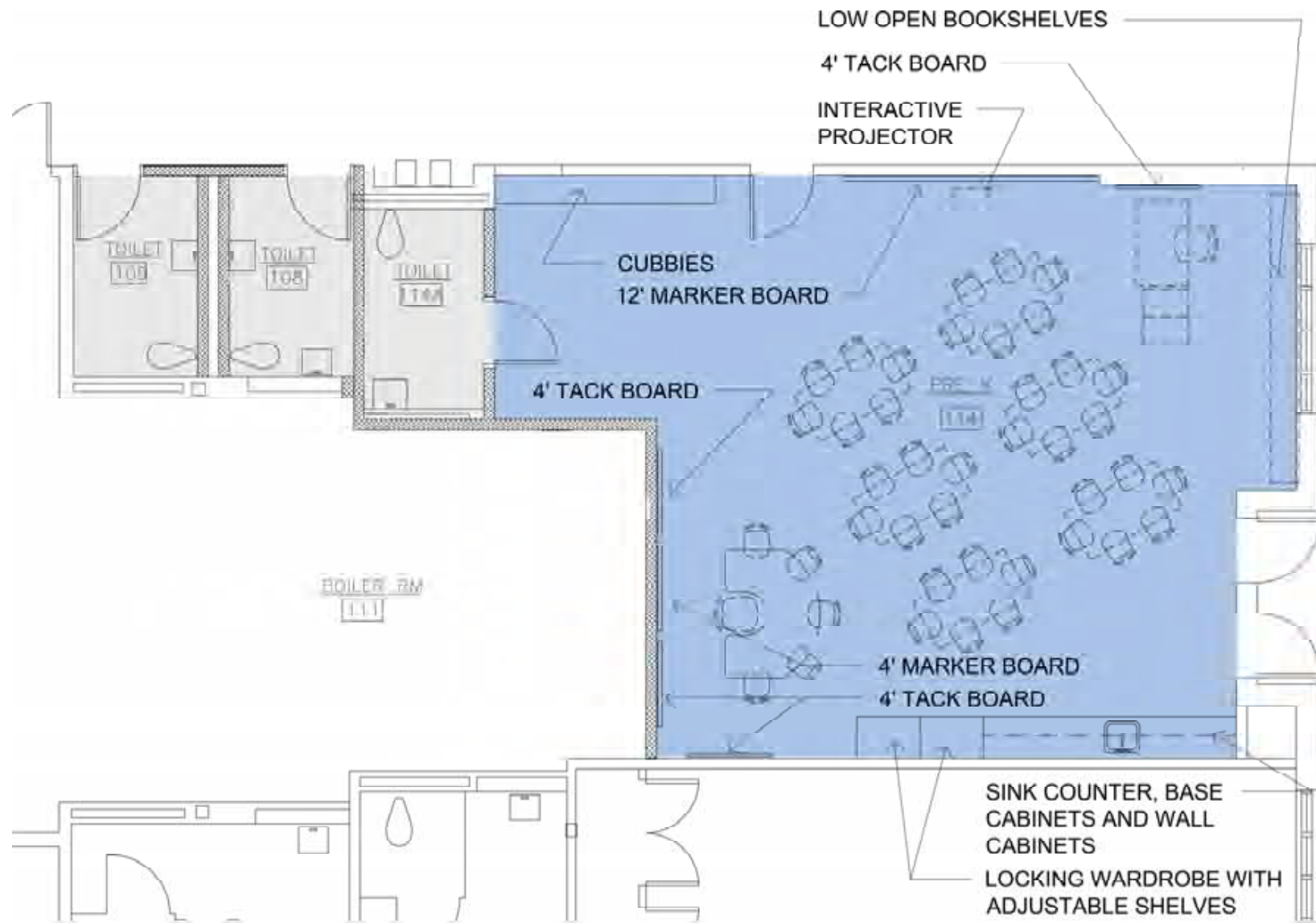
Enlarged Plan at Proposed Cafetorium Addition and Add-Alternate Number 3



Enlarged Plan at Proposed Secure Entry Vestibule



Enlarged Plan at P.E. Activity Room – Add-Alternate Number 1



Proposed Art Room to Pre-K Classroom Renovation

Proposed Space Analysis

Space	Qty.	Phase	S.F.	Total Net S.F.
Administrative Spaces				2,368
Reception	1	Existing	138	138
General Office	1	Existing	282	282
Principal's Office	1	Existing	174	174
Principal's Lavatory	1	Existing	37	37
Assistant Principal's Office	1	Existing	134	134
Testing/Prep Office	1	Existing	38	38
Conference Room	1	Existing	276	276
Work/Prep Room	1	Existing	344	344
Work Room	1	Existing	297	297
Teacher's Lounge	1	Existing	394	394
Parent Liaison Room	1	Existing	188	188
Staff Lavatory	1	Existing	66	66
Cafetorium/Kitchen				5,815
Student Dining	1	Existing	2,441	2,441
Cafetorium Addition	1	Proposed	1,503	1,503
Stage	1	Existing	516	516
Chair Storage	1	Existing	180	180
Kitchen	1	Existing	675	675
Dish Wash	1	Existing	226	226
Storage	1	Existing	132	132
Locker	1	Existing	70	70
Janitor's Closet	1	Existing	18	18
Kitchen Office	1	Existing	54	54
Classrooms				27,226
Pre-K	1	Existing	965	965
Pre-K (w/ toilet room)	1	Proposed	917	917
Kindergarten	4	Existing	<i>varies</i>	3,536
1st Grade	4	Existing	<i>varies</i>	2,852
2nd Grade	4	Existing	<i>varies</i>	2,730
3rd Grade	4	Existing	<i>varies</i>	2,825

Space	Qty.	Phase	S.F.	Total Net S.F.
4th Grade	4	Existing	<i>varies</i>	2,832
5th Grade	4	Existing	<i>varies</i>	3,145
Proposed Classrooms	7	Proposed	<i>varies</i>	5,683
Technology	1	Proposed	817	817
Alternative Education				
Room	1	Existing	183	183
Computer Lab	1	Existing	645	645
ESOL	1	Existing	96	96

Fine Arts	2,308
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Music Room	1	Existing	375	375
Music Room	1	Proposed	823	823
Storage	1	Existing	38	38
Art Room	1	Proposed	835	835
Storage	1	Proposed	203	203
Kiln	1	Proposed	34	34

Health Services	560
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Waiting	1	Existing	100	100
Treatment/Med Room	1	Existing	120	120
Office/Consult/Exam	1	Existing	100	100
Exam/Isolation Room	1	Existing	100	100
Student Lavatory ADA	1	Existing	100	100
Storage Room	1	Existing	40	40

Physical Education	4,766
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Gymnasium	1	Existing	2,423	2,423
Storage	2	Existing	<i>varies</i>	294
P.E. Activity Room	1	Add-Alt.	1,837	1,837
Storage	3	Add-Alt.	<i>varies</i>	146
Office	1	Existing	66	66

Space	Qty.	Phase	S.F.	Total Net S.F.
Media Center				2,196
Main Reading Room	1	Existing	1,756	1,756
Office/Work Space	1	Existing	297	297
Reading Room	1	Existing	97	97
Storage	1	Existing	46	46
Special Education				1,246
Classroom	2	Existing	<i>varies</i>	406
Teachers' Offices/ Testing Room	1	Existing	840	840
Total Net Educational S.F.				46,485
Miscellaneous Spaces				4,486
Staff Toilets	5	Existing	<i>varies</i>	284
Staff Toilets	4	<i>Proposed</i>	<i>varies</i>	284
Student Toilets	15	Existing	<i>varies</i>	1,660
Proposed Boys' Toilet(s)	2	Proposed	185	370
Proposed Girls' Toilet(s)	2	Proposed	165	330
Boiler Room	1	Existing	700	700
Electrical Room	1	Existing	50	50
Custodial Storage	2	Existing	<i>varies</i>	131
Custodial Office	1	Existing	87	87
Utility/Storage	2	Proposed	<i>varies</i>	448
IT Equipment Room	1	Proposed	80	80
Janitorial Closet	2	Proposed	31	62

Proposed Space Analysis Summary

Total Net Educational S.F.	46,485
Gross Area Factor (Total Bldg S.F.-Total Net Educational S .F.)	26,748
(Admin., Classrooms, Cafetorium., etc.)	63.48%
(Walls, Circulation, Toilets, Mech./Elec., etc.)	36.52%
	100.00%
Gross Area of Building	73,233

Proposed Exterior Elevations

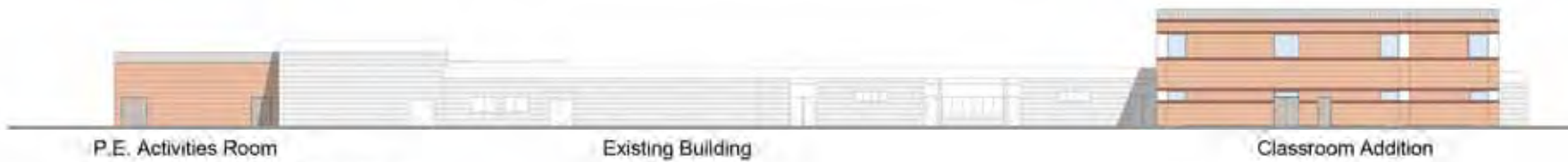
The exterior elevations for the proposed additions were developed to blend with the existing building while still providing a modern aesthetic with distinct character. The field brick matches the color of the existing brick and a continuous deep cornice of metal panels ties the building masses together. A contrasting soldier course is used just beneath the metal cornice, consistent with some areas of the existing building. This soldier band is repeated at the window heads and sills of the two story addition to break up the expanse of masonry. At the request of the school faculty and staff, a balance was reached between a maximum amount of windows in the classrooms and the extent of interior wall space. High windows at the PE activities room will provide daylight without interfering with room function. Metal panels are used above and between windows for additional texture to minimize the need for brick support lintels. Brick piers, seen at the exterior doors to the existing classrooms, are replicated between the large windows of the cafetorium addition to add texture to the entry façade. See the proposed building elevations on page 29.



Proposed West (Entry) Elevation



Proposed South Elevation



Proposed East Elevation



Proposed North Elevation

Proposed Exterior Elevations

Mechanical Narrative

The mechanical and fire protections systems will be designed in accordance with applicable local, state and federal codes/standards including the following:

- International Building Code
- International Mechanical Code
- National Standard Plumbing Code
- International Energy Code
- American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
- National Fire Protection Agency (NFPA) Standards
- Howard County Public School System (HCPSS) standards

Utilities

Utility work exterior to the building is not anticipated at this time. The following utilities are available for connection within the existing building: chilled water, heating water, domestic hot and cold water, and natural gas. Replacement of the existing boilers will increase the gas load to the building beyond its current capacity, requiring replacement of the existing gas meter.

Heating, Ventilating and Air Conditioning (HVAC)

HVAC Design Criteria

The HVAC system is anticipated to be designed in accordance with the following criteria:

Outdoor Temperature:	Summer	95° F db / 78° F wb
	Winter	0° F db
Indoor Temperature:	Summer	75° F +/- 2° F, max 60% RH
	Winter	70° F +/- 2° F, max 60% RH
Ventilation:	ASHRAE Standard 62.1 compliance	
Building Envelope:	Wall, window and roof U-factors as well as window shading coefficients will meet or exceed ASHRAE Standard 90.1 requirements.	

Cooling System

The existing primary cooling source for the building is an indoor water cooled chiller with a roof mounted cooling tower. The existing system is near maximum capacity and will not be utilized to serve the proposed building additions. In addition to the chilled water system serving the original classroom areas, multiple rooftop direct expansion (DX) units serve the remainder of the building. The recent 2008 kindergarten addition was provided with a rooftop DX unit serving a variable volume distribution system. The three proposed building additions will be provided with similar rooftop DX equipment to meet the cooling requirements.

Construction Documents Cooling System Revisions

As a result of additional meetings with the HCPSS Facilities group, the existing mechanical room was reconfigured to accommodate replacement of the existing chiller with a quieter, more energy efficient magnetic bearing chiller. Power requirements for this equipment necessitated the addition of a new transformer, space for which was provided through minor adjustments of the proposed pre-K classroom.

Heating System

Heating water is currently being generated by two (2) gas-fired cast iron boilers located within an interior mechanical room. While the existing boilers can accommodate the current heating demand with some redundant capacity, there does not appear to be capacity available to serve the proposed building additions and also provide additional redundant capacity. Therefore, the existing boilers are anticipated to be replaced with two (2) gas-fired high efficiency condensing boilers with approximate capacity of 2,760 MBH gross output each. The new boilers are anticipated to be located in the same location as the existing boilers.

The existing heating water pumps will be replaced as well to match the new heating flow requirement. Heating water pumps will be vertical in-line or base mounted end suction type with vibration isolation. The heating water pumps will be controlled by variable frequency drives to maximize energy conservation.

Existing heating water piping will be extended to the air handling units and miscellaneous heating equipment (unit heaters, cabinet heaters, radiant panels, etc.) in the winter. Perimeter heat (ie. radiant panels) will be provided for occupied spaces with windows adjacent to the building exterior. In addition, heating water will be provided to the air volume terminal (VAV) heating coils year around.

Where possible, heating water will be piped for reverse return and will be insulated throughout.

Air Distribution System

Three (3) packaged rooftop DX air handling units (AHU's) are anticipated to be furnished to deliver conditioned and ventilated air to all occupied spaces for each of the proposed additions.

The air handling units serving the cafeteria and classroom additions will be variable air volume type and each will be provided with a hot water heating coil, DX cooling coil, filters, as well as access sections for maintenance access to all coils, filters, etc. Conditioned air will be distributed through medium pressure ductwork to pressure independent air volume (VAV) terminals.

The air handling unit serving the Activities Room addition will be constant volume heating and ventilating unit, and be provided with a hot water heating coil, filters, as well as access sections for maintenance access to all coils, filters, etc.

Automatic Temperature Controls

Automatic temperature controls for all new HVAC equipment will be direct digital control (DDC) type with electric actuation. Each control function and associated control point of all mechanical equipment shall be incorporated into the building temperature control system. All temperature control work will interface with the HCPSS energy management control system.

All existing HVAC equipment is currently provided with pneumatic controls under the base bid, the existing pneumatics are not anticipated to be upgraded to DDC.

Add Alternate Number 2

Under Add Alternate Number 2, the following existing HVAC equipment controls will be upgraded to DDC with electric actuation:

Quantity	Description	Quantity	Description
1	Indoor Water Cooled Chiller	4	Base Board Radiation
1	Cooling Tower	6	Convectors
10	Pumps	1	Unit Heater
9	Air Handling Units	7	Cabinet Unit Heater
25	Fans	12	Duct Mounted Hot Water

			Coils
3	Air Cooled Condensing Units	9	Air Terminal Units
31	Fan Coil Units		

Plumbing

Plumbing fixture types and flow restrictions will be in accordance with the National Standard Plumbing Code and HCPSS standards. Handicapped requirements will comply with the Americans with Disabilities Act (ADA) and ANSI Standards.

Low water use fixtures will be utilized to maximize water conservation. Low flow fixtures are anticipated to include 1.28 gallon per flush (gpf) water closets, 0.125 gpf urinals as well as 0.5 gpm sinks and lavatories. In addition, manually operated flush valves and faucets are anticipated to be provided.

Domestic hot water is anticipated to be extended from the existing domestic water distribution system.

All domestic water piping will be type L copper. In addition, all piping will be insulated in accordance with ASHRAE 90.1 and a hot water recirculation system will be provided. Isolation valves will be provided throughout the domestic water system to allow maintenance to occur with minimal impact to other areas of the building. Access panels/doors will be provided for all components that require maintenance.

All waste and drainage piping will be cast-iron; plastic and galvanized pipe will not be utilized. In addition, all toilet rooms and shall be provided with floor drains. All drains will include a trap primer.

Fire Protection

A wet pipe sprinkler system will be provided for each of the building additions. The existing sprinkler distribution system is anticipated to be upgraded and extended to each of the proposed additions.

Recessed type sprinkler heads will be utilized in all areas except storage rooms, mechanical rooms, etc. Where piping is exposed, upright heads will be provided.

Electrical Narrative

Power Distribution

The existing electrical service at Laurel Woods is provided by BGE at 208/120 volt, 3 phase, 4 wire via underground service entrance conductors. The main service entrance switchboard is rated for 2500 Amp, 208/120 volt with a 2500 Amp main disconnect circuit breaker. It contains a utility CT section, main circuit breaker section and a distribution section which is used to feed the building's branch circuit panelboards. The peak load obtained from BGE for the building is 348 kW at 0.9 power factor or 1,073 Amps. There is spare capacity available at the main switchboard, however this capacity cannot be utilized for this project because there are no spare circuit breakers or spaces available in the distribution section of the service switchboard. The design of the proposed adjacent pre-K classroom has been adjusted to provide space in the boiler room for an additional distribution section to support the additional branch circuit panelboards required. The new distribution section will consist of molded case circuit breakers with electronic adjustable trip setting.

The distribution equipment will consist of 208/120 volt panelboards provided as necessary to serve the lighting and receptacle branch circuits. These panels will be located in electric closets. Individual combination magnetic motor starters and motor circuit protectors will be provided for support of the mechanical equipment. Variable frequency drives (VFD's) with by-pass will be provided for all motors that require adjustable speed operation. The panelboard serving the computer load will be provided with 200 percent neutral and transient voltage surge suppressors. All branch circuits and feeders will be installed in conduits with a separate green grounding wire. A heat tracing system for all the exterior chilled water piping will be connected to the emergency power distribution system.

Construction Documents Revisions to the Electrical Systems

A 208 volt to 480 volt transformer is provided for the proposed magnetic bearing chiller.

Emergency Power

A new emergency generator in a sound attenuated enclosure with a critical grade exhaust silencer will be located outdoors. The 208/120 volt automatic transfer switches, emergency distribution and branch circuit panelboards and dry type transformers for the life safety and optional branches of the emergency power distribution system will be located in the extension to the boiler room.

The following emergency loads will be connected to the life safety branch of the emergency distribution system:

- Egress and exit lighting.
- Fire detection and alarm system (also provided with integral battery backup).
- Security and access control system (also provided with integral battery backup).
- Generator auxiliary systems.

The non-essential emergency load will be connected to the optional branch of the emergency distribution system.

Construction Documents Revisions to Emergency Power

In response to a letter from MEMA, the emergency power system was expanded to provide general operation, with heating and ventilation, for designated areas of the proposed and existing facility. These areas include the front vestibule, main office reception room and work area, the health suite, cafeteria, kitchen, gymnasium, the main hallways serving these areas and the toilet rooms located along these hallways. Mechanical and electrical systems serving these areas will be connected to a new tap box at the exterior of the building for connection to a portable emergency generator in the event of an emergency.

Lighting

The lighting design for the additions will be in accordance with the design requirements and usage of each space. Zonal cavity and/or point by point calculations will be provided for each space utilizing the effective reflectance of ceilings, walls and floors while considering the light loss factor and the co-efficient of utilization to maintain the recommended light level at the working surfaces. Coefficients of utilization will be obtained from the particular lighting fixture cuts after the final fixture selections are made. The Illuminating Engineering Society's (IES) recommended footcandle levels will be maintained throughout the spaces.

In general, 2' x 4' recessed fluorescent fixtures with T5 lamps, electronic ballasts and prismatic acrylic lenses will be used. Other energy saving lamp types such as compact fluorescent downlights and HID lights will also be provided for the interior and exterior lighting design. All ballasts will be energy efficient electronic type with 10 percent total harmonic distortion (THD). The proper number of egress lights and exit signs on emergency circuits will be provided as per the National Fire Prevention Association (NFPA) Life Safety Code.

Lighting controls will consist of digital lighting management (DLM) control system that automatically maximizes lighting energy efficiency. DLM includes room controllers and occupancy sensors, interfaces and accessories that provide convenient energy-saving control of switched loads. DLM will be used for stand-alone control of individual building spaces.

Egress and exit lighting will be provided in accordance with NFPA Life Safety Codes. The branch circuits for the emergency and exit lighting will be connected to the emergency distribution system. The emergency lighting fixtures will be switchable by using a generator transfer device, transferring power to the emergency generator during a power outage.

Fire Alarm System

An addressable, electrically supervised, microprocessor based fire alarm and detection system will be provided to replace the existing hardwired system to meet the International Building Code (IBC) and the International Fire Code (IFC) requirements. The new fire alarm system with voice evacuation will be provided for the entire school. Initiating devices will include manual stations, smoke detectors, thermal detectors, duct type smoke detectors, interface modules for sprinkler flow switches and valve position switches. Indicating devices will include combination speaker/strobe devices and supplementary visual devices. Audible and visual alarm signals will operate throughout entire building. Auxiliary devices will include control modules for remote signaling and control.

Interface with the new elevator for "recall" and power shunt trip will be provided. The fire alarm control panel will be located in the electrical room. A fire alarm annunciator panel will be provided at the main entrance.

The fire alarm system will be designed in accordance with the State of Maryland Fire Code, IBC and NFPA. All audible, visual, and initiating devices will be designed to meet ADA requirements.

Construction Cost Estimate

Additions to Laurel Woods Elementary School

	S/D Phase	D/D Phase	C/D Phase
Site Work	\$745,139	\$938,475	\$1,053,080
Additions and Renovations	\$4,197,282	\$4,958,769	\$4,951,792
MEMA Emergency Shelter mandate	NA	NA	\$338,718
Total for Project	\$4,942,421	\$5,897,244	\$6,343,590
Options:			
Add-Alternate for P.E. activities room addition	\$401,655	\$438,172	\$373,591
Add-Alternate for upgrade to DDC controls	\$297,552	\$321,172	\$387,397
Add-Alternate for kitchen serving line	NA	NA	\$35,168
Total for Project (including Options)	\$5,641,628	\$6,656,588	\$7,139,746

Notes

- Construction cost estimate was prepared by the construction manager, J. Vinton Schafer & Sons Inc, and assumes that bids will be received in May 2014.
- Estimate includes a construction documents phase cost estimate contingency of +6 percent.
- Estimate assumes non-wage rate pricing. (Add 9 percent for wage rate)
- Estimate does not include a project contingency.