BLAIR G. EWING CENTER

MODIFICATION FEASIBILITY STUDY

Prepared for

Montgomery County Public Schools

By

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I. INTRODUCTION

This modification feasibility study was conducted for Montgomery County Public Schools (MCPS) by the architectural firm Hord Coplan Macht. The Blair G. Ewing Center is located at 14501 Avery Road Rockville, MD 20853. The work was performed under the direction of the MCPS Department of Facilities Management, Division of Construction.

Feasibility Study Participants

The feasibility study participants reviewed, revised, and approved the design concepts for the Blair G. Ewing Center modification. The meetings occurred on May 29, 2013; June 18, 2013; July 11, 2013; July 30, 2013. The proposed designs are a result of the participant's suggestions and guidance during the process.

Deborah Szyfer	Planner, MCPS Division of Planning
Ira Thomas	Principal, Blair G. Ewing Center
Joy Jackson	Teacher, Blair G. Ewing Center
Michael Shpur	Architect, MCPS Division of Construction
Ray Marhamati	Project Manager, MCPS Division of Construction
Zach Larnard	Planner, MCPS Division of Planning

II. EXECUTIVE SUMMARY

Purpose

The purpose of this feasibility study is to explore modification and improvement options to accommodate the educational specification requirements for Blair G Ewing Center. Further, this study provides specific recommendations to the Montgomery County Public Schools (MCPS) for implementation. When completed, the modified facility will accommodate middle and high school student's four academies and twenty-eight (28) classrooms along with shared core functions.

History

Blair G. Ewing Center is located at 14501 Avery Road Rockville, MD 20853. The original split-story structure was built in 1970 with a total of 85,400 gross square feet (GSF). Originally named, the Mark Twain School, it was designed as a specialized facility to provide alternative education for Lower School, Middle School, and Upper School Students. Only minor alterations have been made to the building, which opened in 1970. In 2009, two classrooms and a Science Lab were renovated.

Existing Facility Challenges

The existing school has been evaluated by a team of architects and engineers to determine what is required to modify the school to comply with the project space summary, dated June 5, 2013. Per the project space summary, the school will need to have a total of 54, 123 net square feet (NSF). The current building totals 61,190 NSF of space, so no net square feet (NSF) needs to be added to meet the project space summary. The site is expected to remain unchanged. Adequate parking, circulation and bus loops exist.

II. EXECUTIVE SUMMARY

Methodology

Equipped with an understanding of the project challenges, the design team was tasked with creating renovation options with varying degrees on intervention for review by staff and community at a series of public meetings. After each meeting, the options were further refined based on the comments received. This study is based on the following:

- Public meetings with the Feasibility Study participants and MCPS Staff.
    - There were four meetings.
    - The meetings were attended by the Principal and MCPS Staff.
- Analysis of the existing facility.
- Review of the existing condition documents provided by MCPS.
- Research and site visits conducted by the design team.

The initial analysis and review resulted in three options. All three options created a new main entrance and moved Administration from the second floor to this location, in-filled the swimming pool and made the necessary code compliant upgrades. Option 1 was designed to keep as many of the existing interior walls as possible. Option 2 made larger alternations in the interior and a two-story dining hall was created. Option 2 also maintains the Science Lab renovated in 2009. In Option 3, the interior alterations are the most extensive. The alterations were made to create spaces sized to meet the project space summary with the correct adjacencies. A two-story dining hall, distinct academy pods, informal learning spaces, and the organization of all shared programs outside of the respective academies were included.

II. EXECUTIVE SUMMARY

Overview

The existing Blair G. Ewing facility is situated on a 22.54 acre parcel at 14501 Avery Road Rockville, MD 20853. The site is bounded to the West by Rock Creek, to the South by Norbeck Rd, to the East by Aery Rd and Red Gate Golf Course and to the North athletic fields ran by Montgomery County Recs and Parks.

The site is slopes toward the West and Rock Creek. The boundaries of the center's property have very mature, dense trees that create a beautiful setting for the school. The site slope allows for on grade access to the lower level of the building.

There are four curb cuts that provide access to the different "pod" of the center and the 147 (5 ADA) designated parking spaces for vehicles and two bus loops. Currently the bus loops are integrated within the existing parking and are not separate loops. The service road, loading dock, and trash area is located along the western side of the school. Currently the center's main entrance is tucked away in the southwest corner of the building.

The existing structure is constructed of non-combustible materials. The exterior walls are masonry with brick veneer. The original 1970 building does not have a cavity or insulation within its exterior masonry walls. The structural system is predominately load bearing masonry walls, steel roof joists, and concrete slabs-on-grade. The building is severely limited in exterior fenestration. A majority of classroom have only one 2'-6" wide window. The building is sprinklered. The school's interior finishes are dark, worn, and are at the end of their useful life.

The feasibility of each option will be determined by the project's budget. The options were create to provide different levels of interventions. In each option the MEP and life safety systems will be modified and brought to current code.

The preferred option is Option 3. This option provides the Center with spaces meeting the program space requirements, distinct, identifiable Academies, a large central gather place (which doubles as the dining hall. Option 3 adds daylight into each classroom and creates clear circulation, which organizes all of the shared common spaces outside of each academy.

Cost estimates were established for each option, and are presented in the Description of Options section of this report.

II. EXECUTIVE SUMMARY

Common Design Elements

Site

- Existing parking and bus loop will not be changed.
- Students are dropped off at their academy entries.
- The building will have one main entry.

BUILDING

- A welcoming and easily identifiable main entry is provided.
- The Academies are in distinct clusters.
- The Academy identities and way finding will be increased.
- Middle School and High School Students will be separated.
- The interior circulation will be simplified and clarified interior.
- Increased connections to the exterior are proposed.

II. EXECUTIVE SUMMARY

Option 1

Option 1 proposes modification by creating a new main entrance, relocating Administration from the second floor to the ground floor main entrance. All interior finishes will be updated or replaced to create bright, vibrant, colorful spaces.

The program is squeezed to fit within in the current wall configurations, creating s discrepancies with the program space summary. Also the desired program adjacencies are unable to be completely met.

The 2009 Science Lab renovation is kept, but in a location that doesn't not comply with school adjacency requirements.

All new infrastructure and systems will be designed to meet MCPS standards. These include the HVAC, life safety, fire protection, electrical, lighting, data and communication systems. The modified facility will comply with accessibility codes.

Option 1:

Building	**$ 7,577,000**
MEP / Life Safety	**$ 6,123,000**
Total	**$ 13,700,000**

II. EXECUTIVE SUMMARY

Option 2

Option2 proposes modification by creating a new main entrance, relocating Administration from the second floor to the ground floor main entrance. All interior finishes will be updated or replaced to create bright, vibrant, colorful spaces.

Option 2 proposes more interior walls be demolished and reconfigured. This helps lesson the discrepancies with the program space summary, it also allows the Academies to become more distinct clusters and improves program adjacencies.

The 2009 Science Lab renovation is kept.

The biggest intervention is the creation of a light filled two story dining hall in the center of the building. The space provides a critical gather space for the entire building as a central organizing element.

All new infrastructure and systems will be designed to meet MCPS standards. These include the HVAC, life safety, fire protection, electrical, lighting, data and communication systems. The modified facility will comply with accessibility codes.

Option 2:

Building	**$ 8,077,000**
MEP / Life Safety	**$ 6,123,000**
Total	**$ 14,200,000**

II. EXECUTIVE SUMMARY

Option 3 (preferred)

Option3 modifies the building by creating a new main entrance, relocating Administration from the second floor to the ground floor main entrance. All interior finishes will be updated or replaced to create bright, vibrant, colorful spaces.

Option 3 proposes the most extensive interior renovation. The renovation meets the program space summary and creates the preferred adjacencies.

The biggest intervention is the creation of a light filled two story dining hall in the center of the building. The space provides a critical gather space for the entire building as a central organizing element.

All new infrastructure and systems will be designed to meet MCPS standards. These include the HVAC, life safety, fire protection, electrical, lighting, data and communication systems. The modified facility will comply with accessibility codes.

Option 3:

Building	**$ 8,377,000**
MEP / Life Safety	**$ 6,123,000**
Total	**$ 14,500,000**

II. EXECUTIVE SUMMARY (continued)

Cost Analysis

Presented below is a tabulation of areas and costs associated with each recommended option for the modification of Blair G. Ewing Center. This cost estimate in this feasibility study is based on current construction market conditions for both building and site. The estimates will be revised to reflect market conditions and prevailing construction costs when the project is included in the Capital Improvements Program Request tor architectural and construction funding.

Square Footage

	Option 1	Option 2	Option 3 (Preferred)		
Existing	85,400	85,400	85,400		
New Construction	0	0	0		
Renovation	85,400	85,400	85,400		
Demolition (Total)	0	0	0		
Existing To Remain	0	0	0		
Total Gross	85,400	85,400	85,400		

PDF/ FEASIBILITY STUDY COST OUTLINE

Building Construction Cost Estimate	$13,700,000	$14,200,000	$14,500,000		
Project Planning Cost	$959,000	$994,000	$1,015,000		
Contingency	$801,450	$830,700	$848,250		
Total Cost in FY 2013 Dollars	**$15,460,450**	**$16,024,700**	**$16,363,250**		

Notes:

1. This cost estimate does not include furniture and equipment.
2. This estimate does not include site costs

II. EXECUTIVE SUMMARY

Conclusions and Recommendations

Of the three options presented only one of them meets the project goals. This is Option 3. In Options 1 and 2 compromises are made by saving interior partitions. The compromises, made for budgetary concerns, relay on finishes and furniture to modify the look and feel of the building. The advantages of Option 3 are numerous and are outlined in Section V of this report.

Option 3 is consistent with MCPS standards, program requirements, and addresses the interests and concerns of the principal, school staff. In accordance with the thoughts of the feasibility study participants and MCPS staff, the design team recommends that the project move forward with Option 3.

III. SCOPE, METHODOLOGY AND GOALS

Scope and Intent

Montgomery County Public Schools (MCPS) wants to upgrade the Blair G. Ewing Center to meet current specifications relative to educational programs, instructional philosophy, program space allocations, energy use, accessibility and life safety. When completed, the facility will house Academies in distinct locations within a space where students feel valued helping them transition back to their home school.

The A/E design team analyzed the educational specifications, met with the school and developed initial building concepts addressing the modification criteria. The Feasibility Study participants reviewed the progression of these concepts throughout the design process. Their comments and suggestions were discussed, refined and incorporated at each step during the process. The final concepts are presented in this report.

Methodology

The existing school has been evaluated by a team of Architects and Engineers to determine what was required to modify the school to comply with the program space summary, dated June 5, 2013. From the beginning of the project, it was immediately apparent that the existing site was going to have spatial challenges in order to meet the requirements of the program space summary. Though, the existing building is large enough to house the updated program, its configuration presents challenges. The existing building was designed to house lower, middle, and upper school students. In an effort to separate these students the building was designed as a series of pods. While, these pods create distinct areas within the building, their current size and configuration does not match the new program and desired program adjacencies. Equipped with an understanding of the project challenges, the design team was tasked with creating and presenting multiple options for review by both the Blair G. Ewing Center staff and the community. The options were presented and reviewed at a series of public meetings and subsequently refined based on the comments received.

III. SCOPE, METHODOLOGY AND GOALS

This study is based on the following:

- Public meetings with the Feasibility Study participants and MCPS Staff.
    - There were four meetings.
    - The meetings were attended by the Principal and MCPS Staff.
- Analysis of the existing facility.
- Review of the existing condition documents provided by MCPS.

The initial analysis and review resulted in three options. All three options created a new main entrance and moved Administration from the second floor to this location, in-filled the swimming pool and made the necessary code compliant upgrades. Option 1 was designed to keep as many of the existing interior walls as possible. Option 2 made larger alternations in the interior; a two-story dining hall was created. Option 2 also keeps the Science Lab renovated in 2009. In Option 3, the interior alternations are the most extensive. The alternations were made to create spaces sized to meet the project space summary with the correct adjacencies. A two-story dining hall, distinct academy pods, informal learning spaces, and the organization of all shared program outside of the respective academies were included.

III. SCOPE, METHODOLOGY AND GOALS

General Goals

The following is a list of project goals that have been developed over the series of public meetings. It articulates the goals and hopes for the modification:

- Identifiable Main Entrance
- If Students feel valued, they will value the space.
- Reimage | Redesign
- Space Must be sold as an intervention space not punishment
- A place that makes you feel better to be there.
- Intervention leading to Transformation
- Inside | Outside relationship

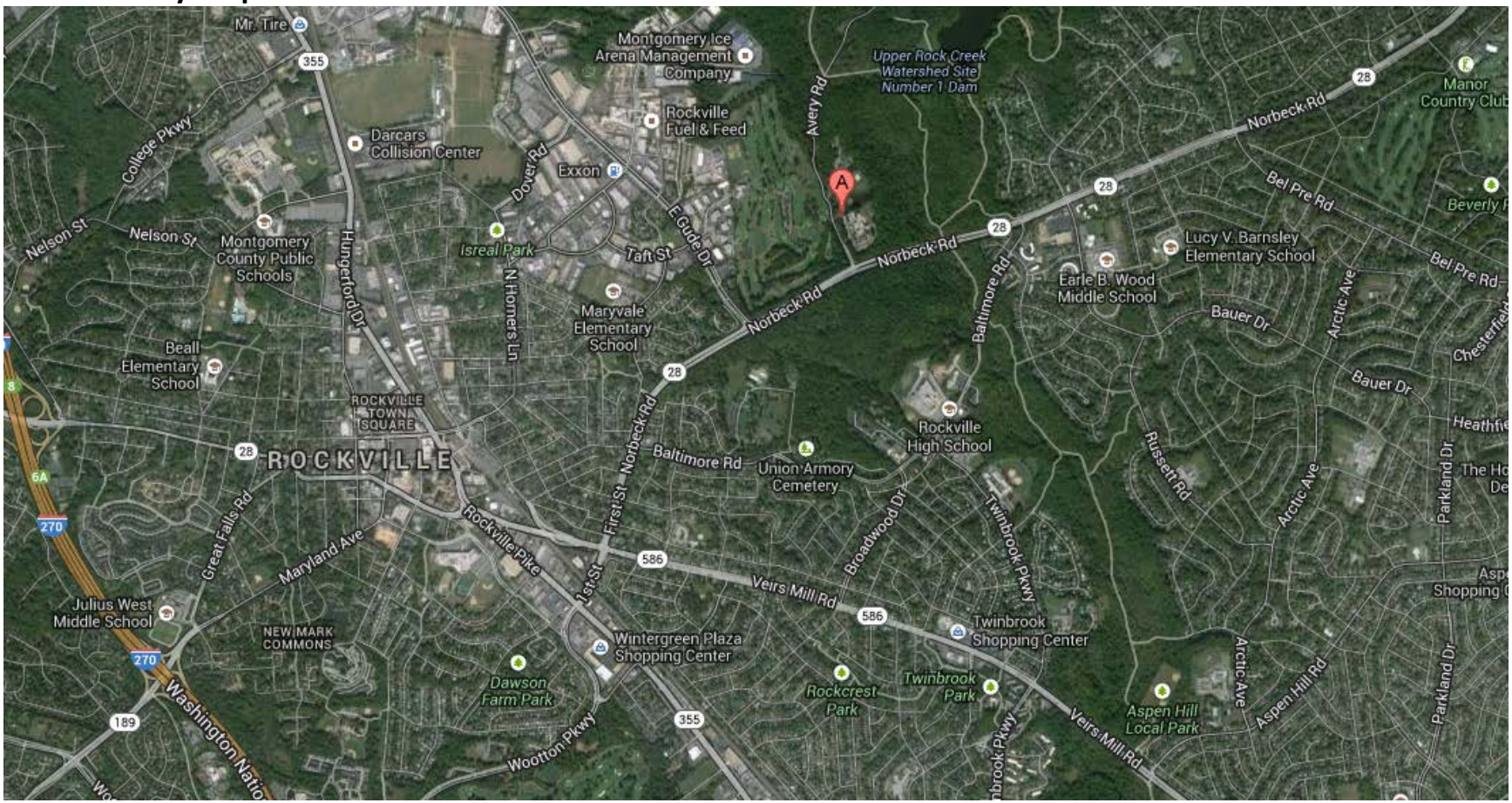
Building Goals

The following goals and objectives have been developed as a summary of the comments received from the public meeting process. The modified building shall:

- A welcoming and easily identifiable main entry is provided.
- Distinct Academy clusters
- Increased Academy identities and way finding.
- Separation of Middle School and High School Students
- Simplify and clarify interior circulation.
- Increased connections to the exterior.

IV. EXISTING CONDITIONS

Vicinity Map

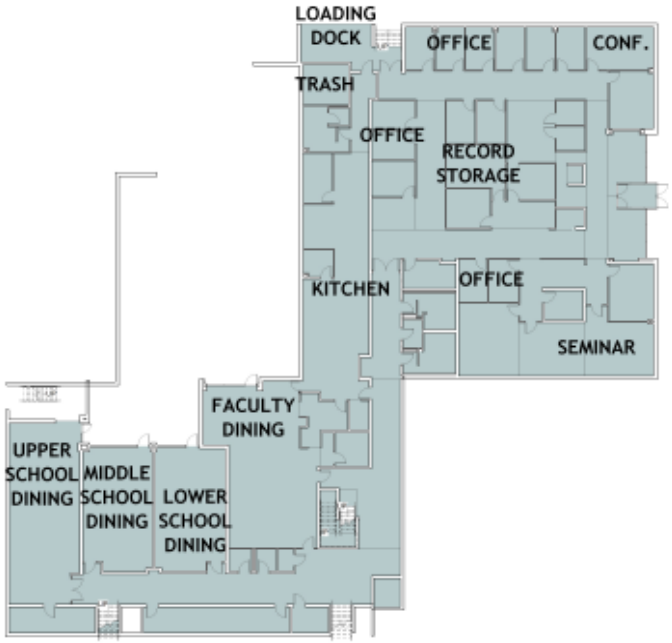


IV. EXISTING CONDITIONS

Existing – Site Plan

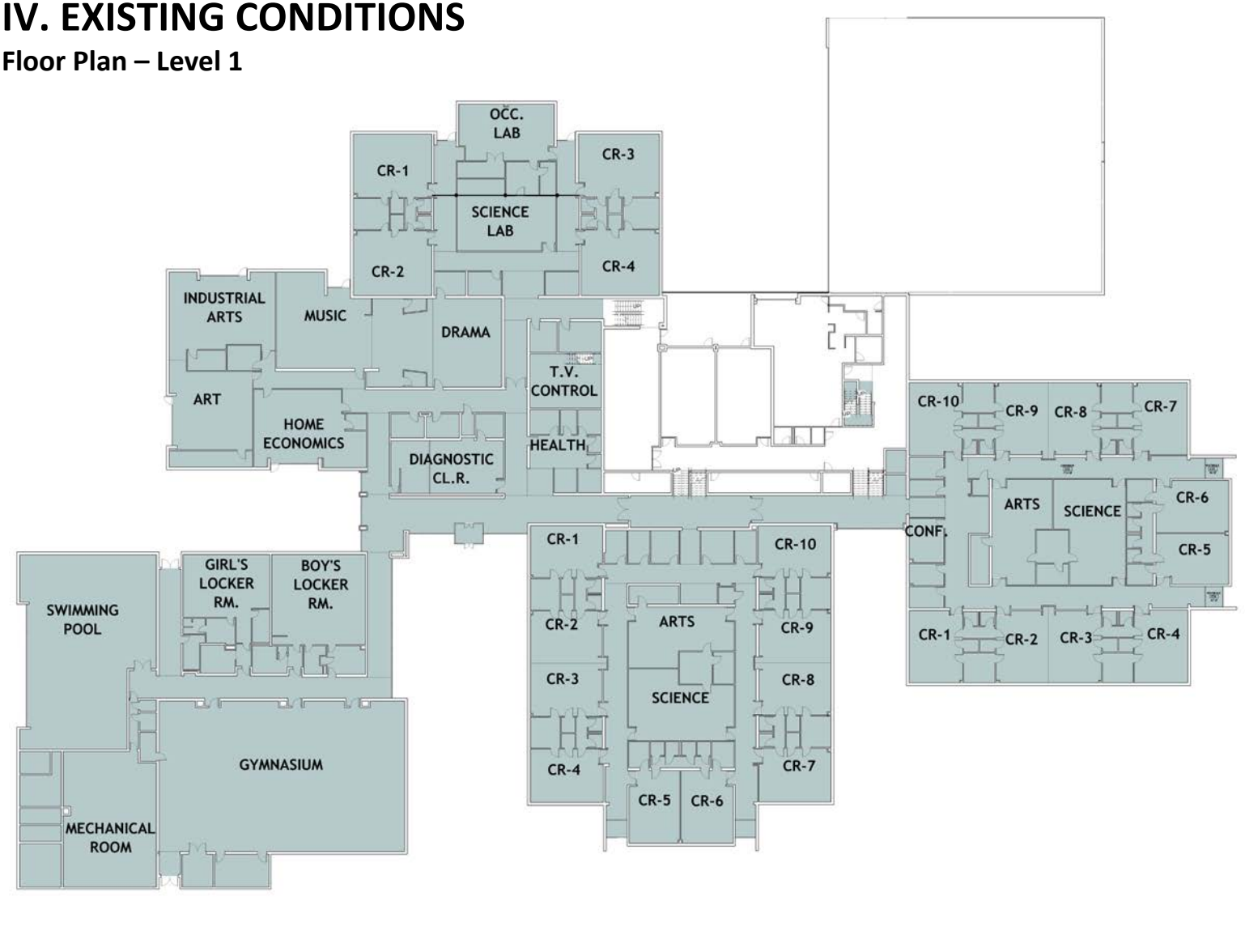
IV. EXISTING CONDITIONS

Floor Plan – Level 0



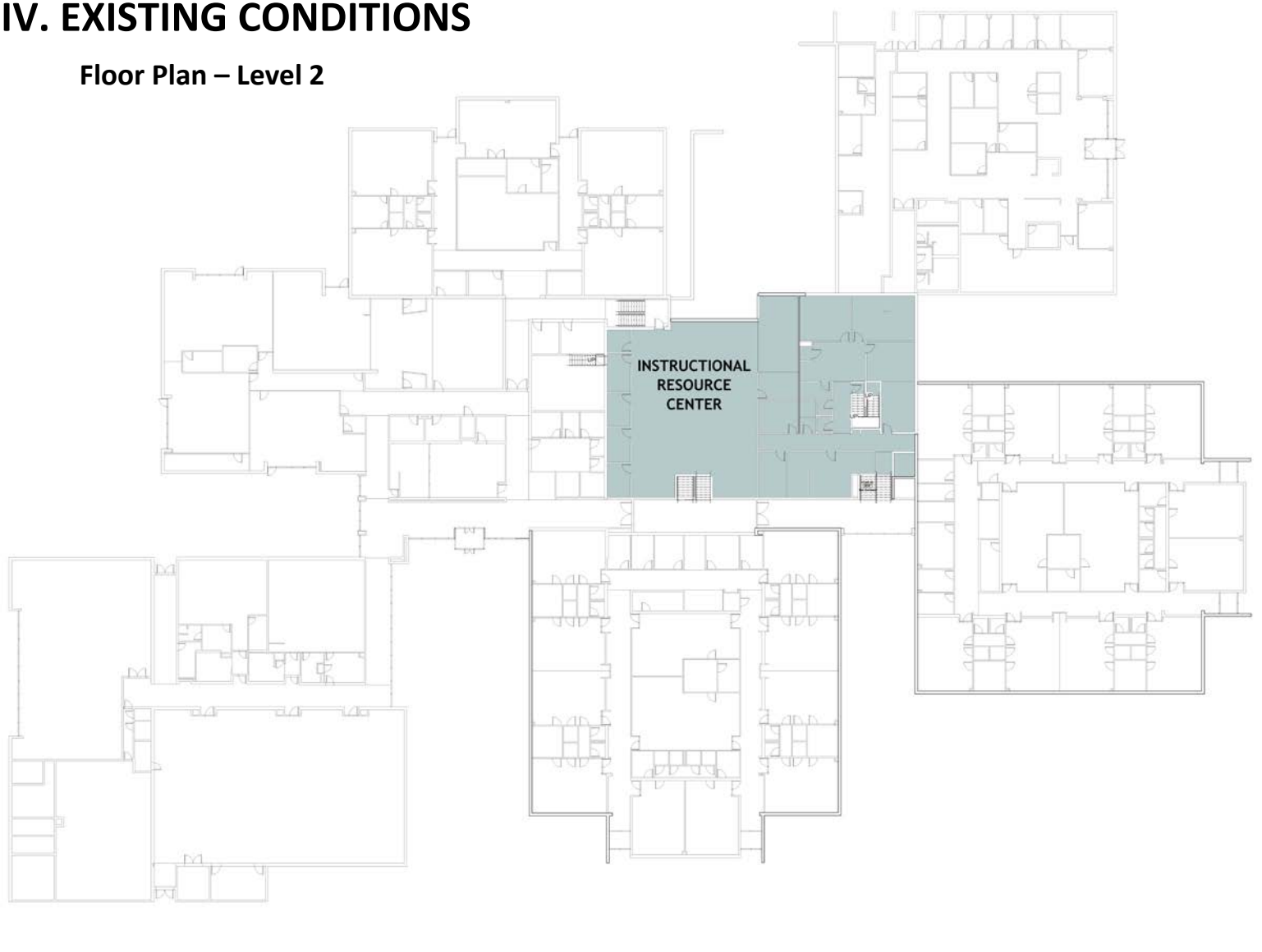
IV. EXISTING CONDITIONS

Floor Plan – Level 1



IV. EXISTING CONDITIONS

Floor Plan – Level 2



IV. EXISTING CONDITIONS

Existing Conditions Summary

The existing Blair G. Ewing facility is situated on a 22.54 acre parcel at 14501 Avery Road Rockville, MD 20853. The site is bounded to the West by Rock Creek, to the South by Norbeck Rd, to the East by Aery Rd and Red Gate Golf Course and to the North athletic fields ran by Montgomery County Recs and Parks.

The site is slopes toward the West and Rock Creek. The boundaries of the center's property have very mature, dense trees that create a beautiful setting for the school. The site slope allows for on grade access to the lower level of the building.

There are four curb cuts that provide access to the different "pod" of the center and the 147 (5 ADA) designated parking spaces for vehicles and two bus loops. Currently the bus loops are integrated within the existing parking and are not separate loops. The service road, loading dock, and trash area is located along the western side of the school. Currently the center's main entrance is tucked away in the southwest corner of the building.

The existing structure is constructed of non-combustible materials. The exterior walls are masonry with brick veneer. The original 1970 building does not have a cavity or insulation within its exterior masonry walls. The structural system is predominately load bearing masonry walls, steel roof joists, and concrete slabs-on-grade. The building is severely limited in exterior fenestration. A majority of classroom have only one 2'-6" wide window. The 1970 building is sprinklered. The school's interior finishes are dark, worn, and are at the end of their useful life.

Refer to Appendix C for more information.

V. DESCRIPTION OF OPTIONS

General

Three options were developed in response to the MCPS educational specifications for Blair G. Ewing Center. Each option addresses the desired physical and instructional improvements to the school, and satisfies the program space summary requirements to varying degrees of success.

Common Design Elements for Options 1, 2 & 3

SITE

- The site, parking, bus loop, and storm water management will remain as is.
- The main entrance to the building will be relocated to the center of the building on the West Side.

ARCHITECTURAL

- A welcoming and easily identifiable main entry is provided
- Distinct Academy clusters, with identifiable entries (with varying degrees of refinement in each option)
- Updated Interior finishes

V. DESCRIPTION OF OPTIONS

Mechanical

To accommodate the three proposed building improvement options, a complete replacement of the existing heating water, chilled water, and HVAC systems is recommended. The existing mechanical system components serving the facility are in poor working condition and have exceeded their useful service life. Many of these mechanical systems are exposed within the areas served, making them susceptible to damage and vandalism. In addition, the existing systems lend themselves to high energy usage due to their constant volume operation and lack of energy recovery. For these reasons, replacement of the existing mechanical systems with a new system capable of providing a more energy efficient solution for ventilation and space conditioning is recommended. Mechanical equipment should be located outside the classroom area, safeguarding these components from damage and facilitating ease of maintenance. Similar to the existing four-pipe distribution system, the new HVAC system should be capable of providing independent heating or cooling to each space throughout the year.

Based on these considerations, three mechanical system options were evaluated. These options are described in further detail below:

Option 1 (Ground-Source Geothermal Heat Pump Unit System)

The installation of a ground-source geothermal heat pump system is one potential option for supporting the modified facility. This type of mechanical system provides the ability to have either heating or cooling year-round, while delivering a very high level of overall building energy efficiency.

To support the proposed mechanical system, a geothermal borehole field would be positioned below the adjacent athletic fields. These fields are currently owned by Parks and Recreation and not MCPS; therefore, approval would need obtained to utilize these fields. Due to the required site area associated with this system, a ground-source geothermal system is not feasible unless MCPS receives this approval.

A pair of base-mounted pumps operating in a lead/lag type arrangement would circulate heat pump loop water throughout the building and borehole field. Major mechanical infrastructure components, including the heat pump loop headers, associated pumps, and expansion tank, would be located within the main mechanical room provided for facility.

Extended range vertical heat pump units are recommended for conditioning classroom areas and would be located within support closets located adjacent to the classroom served. Doors for support closets would be from the corridor for maintenance access.

V. DESCRIPTION OF OPTIONS

The administration and administrative support areas would be provided with space conditioning through a variable refrigerant flow (VRF) system complete with water-cooled compressors connected to the building heat pump loop. Ceiling cassette type indoor VRF units are anticipated throughout.

Conditioned outdoor air for classroom and administration areas would be supplied by a series of rooftop dedicated outdoor air systems, complete with water-cooled compressors for heating and cooling and energy recovery for pre-conditioning and tempering of the outdoor air. Airflow supplied from these units would be dehumidified, conditioned, and delivered directly to each space at a room neutral temperature. Exhaust air from classrooms, toilets rooms, and storage areas would be routed though the energy recovery unit's heat exchanger for pre-conditioning of the outdoor air.

Rooftop type heat pump units are recommended for space conditioning and ventilation within the cafeteria, kitchen, and media center areas, with a gas-fired heating-only rooftop unit provided for the gymnasium area.

Toilet rooms, storage rooms, and other heating-only areas should utilize electric wall heaters.

Controls for the modified facility will be direct digital controls (DDC) throughout. Control system components should be interfaced with the central MCPS energy management control system for remote monitoring and energy management routines.

Option 2 (Water-Source Heat Pump Unit System with Boiler and Cooling Tower)

The installation of a water-source heat pump system connected to a boiler / cooling tower piping loop is another potential option for supporting the modified facility. Similar to Option 1 described above, this type of mechanical system provides the ability to have either heating or cooling year-round, while delivering a high level of overall building energy efficiency.

Mechanical infrastructure for supporting the water-source heat pump loop would be located within the main mechanical room provided for the facility and include gas-fired condensing boilers, a cooling tower, cooling tower pumps, loop distribution pumps, and a plate-and-frame heat exchanger. All pumping systems would be base-mounted and operate in a lead/lag type arrangement.

Extended range vertical heat pump units are recommended for conditioning classroom areas and would be located within support closets located adjacent to the classroom served. Doors for support closets would be from the corridor for maintenance access.

V. DESCRIPTION OF OPTIONS

The administration and administrative support areas would be provided with space conditioning through a VRF system complete with water-cooled compressors connected to the building heat pump loop. The use of air-cooled compressors for supporting the VRF system may also be considered. Ceiling cassette type indoor VRF units are anticipated throughout.

Conditioned outdoor air for classroom and administration areas would be supplied by a series of rooftop dedicated outdoor air systems, complete with water-cooled compressors for heating and cooling and energy recovery for pre-conditioning and tempering of the outdoor air. Airflow supplied from these units would be dehumidified, conditioned, and delivered directly to each space at a room neutral temperature. Exhaust air from classrooms, toilets rooms, and storage areas would be routed though the energy recovery unit's heat exchanger for pre-conditioning of the outdoor air.

Rooftop type heat pump units are recommended for space conditioning and ventilation within the cafeteria, kitchen, and media center areas, with a gas-fired heating-only rooftop unit provided for the gymnasium area.

Toilet rooms, storage rooms, and other heating-only areas should utilize electric wall heaters.

Controls for the modified facility will be direct digital controls (DDC) throughout. Control system components should be interfaced with the central MCPS energy management control system for remote monitoring and energy management routines.

System Option 2 provides the flexibility of allowing the system to function as a ground-source geothermal heat pump system in the future. This flexibility would prove beneficial if the fields currently owned by Parks and Recreation are currently not available; however, may become available for use in the near future. To accommodate these future geothermal capabilities, the use of extended range heat pump units sized to accommodate future geothermal entering water conditions is recommended. In addition, all heat pump loop piping systems should be insulated.

Option 3 (Vertical Four-Pipe Fan Coil Unit System)

The final mechanical system for consideration is a four-pipe fan coil unit system. Similar to Options 1 and 2 described above, this type of mechanical system provides the ability to have either heating or cooling year-round, while delivering a high level of overall building energy efficiency.

V. DESCRIPTION OF OPTIONS

Fan coil units would be provided with chilled water cooling and hot water heating, supplied from the new chilled and heating water infrastructure components described later in this study. Unlike the facilities existing vertical console type equipment, vertical belt-driven fan coil units would be utilized for space conditioning within classroom areas. To safeguard against equipment damage and vandalism,

fan coil units would be located within support closets located adjacent to the classroom served. Doors for support closets would be from the corridor for maintenance access.

The administration and administrative support areas would be provided with space conditioning through a VRF system complete with air-cooled compressors. Ceiling cassette type indoor VRF units are anticipated throughout.

Conditioned outdoor air for classroom and office areas throughout the existing school and proposed building addition would be supplied independent of the new fan coil units. A series of rooftop dedicated outdoor air systems, complete with chilled water cooling, hot water heating, and dual plate and frame type energy recovery devices are anticipated. Airflow supplied from these systems would be dehumidified, conditioned, and delivered directly to each space at a room neutral temperature.

Space conditioning and ventilation for the cafeteria, kitchen, and media center areas would be accomplished through a series of dedicated single-zone variable air volume air-handling units provided for each space. Units would be provided with chilled water cooling and hot water heating. Supply fans for each unit would be equipped with variable frequency drives for reducing airflow quantities during periods of reduced cooling demand.

Heating water for the new mechanical systems would be accomplished by a series of gas-fired condensing boilers, located within a new mechanical room provided for the facility. Heating water generated by these boilers would be distributed through a new heating water distribution piping loop provided for the building.

Chilled water for the new mechanical systems would be accomplished by an air-cooled chiller located at grade. This chiller would be equipped with a remote evaporator, located within a new mechanical room. Chilled water generated by this chiller would be distributed through a new chilled water distribution piping loop provided for the building.

Perimeter toilet rooms, storage rooms, and other heating-only areas would utilize hot water unit heaters for general space conditioning during the winter months.

V. DESCRIPTION OF OPTIONS

Similar to Options 1 and 2 above, controls for the modified facility will be direct digital controls (DDC) throughout. Control system components should be interfaced with the central MCPS energy management control system for remote monitoring and energy management routines.

Recommended HVAC System Option

Based on the three mechanical options described above, Option 3 (vertical four-pipe fan coil unit system) is the recommended approach for the building improvement. Discussions with MCPS confirmed that utilizing the adjacent athletic fields owned by Parks and Recreation is not feasible. For this reason, sufficient site area is not available for supporting a geothermal wellfield, eliminating system Option 1. In addition, the use of these fields in the future is also not feasible. Since the long-term use of geothermal technology is not available for this facility, proceeding with system Option 3 is recommended. This mechanical system provides a high level of energy efficiency, due to the use of dedicated outdoor air systems with energy recovery. In addition, locating mechanical components outside of classroom areas helps with safeguarding these components from damage and vandalism while facilitating ease of maintenance. Finally, this system option provides the ability for independent heating or cooling to each space throughout the year. In general, the proposed vertical four-pipe fan coil unit system provides the most sustainable and energy efficient solution available, while delivering a high level of flexibility at the lowest cost for both current and future needs.

Plumbing Systems

To support the proposed building improvement, replacement of the existing plumbing system components is recommended. The existing plumbing piping, equipment, and fixtures should be removed throughout the entire facility, as many of these components have exceeded their useful service life.

A new combination fire/water service and natural gas service are recommended, with these new services entering the building near the main mechanical room. Domestic and fire services should be separated within the mechanical room, with a dedicated backflow preventer provided on each service.

A new gas-fired condensing type water heater would be provided for creating domestic hot water for the modified facility. This system should be complete with circulation pump, expansion tank, and thermostatic mixing valve.

V. DESCRIPTION OF OPTIONS

New plumbing fixtures should be designed to meet the Americans with Disabilities Act (ADA) and will utilize water conservation features. Floor-mounted water closets would utilize dual-flush type valves, capable of providing either 1.6 or 1.0 gallons per flush. Urinals would be wall-hung and provided with pint flush valves. Wall-hung cast-iron lavatories would utilize self-closing faucets that supply 0.5 gallons per minute. The water consumption figures noted are equal to or less than what is required by both current plumbing code and LEED water conservation requirements.

Fire Protection System

The present fire protection system for the existing school should be removed to support the proposed building improvement concepts and revised architectural floor plan. New sprinkler system components should be provided throughout, with the entire modified facility provided with full sprinkler coverage.

The building should be separated into several zones that match the fire alarm pull zones for the building. It is anticipated that a fire pump is not required, as the building is currently provided with partial sprinkler coverage without the need for a fire pump. This will be evaluated and confirmed during the design phase. All fire protection work should conform to the standards of the National Fire Protection Association (NFPA).

Air-handling units and dedicated outdoor air systems supplying 2,000 cubic feet per minute (CFM) or more of airflow should be equipped with smoke detectors in both the supply and return air ductwork.

V. DESCRIPTION OF OPTIONS

Electrical

The electrical systems required for the building improvement will be similar for each of the three different building improvement concepts being proposed. The existing fire alarm system will remain and be reused with devices added or relocated as may be required. The existing electrical, lighting, communications, and security systems will generally be removed and replaced.

Power Distribution

A new switchboard rated at 277/480 volts 3 phase, 4 wire will be required. The capacity will be approximately 3000 amperes. This will require coordination with PEPCO for a possible upgrade of the building electrical service.

New electrical closets will be located throughout the school and will have electrical equipment to serve the building improvement. Electrical equipment in electrical rooms will consist of new 277/480-volt panelboards for mechanical equipment and lighting and 120/208-volt panelboards for general receptacle, computer, and generator standby loads. New computer panelboards will be fed from K-rated dry-type transformers and will serve computer receptacles in the classrooms.

Three-phase surge protective device (SPD) will be mounted adjacent to each respective computer panel, as well as adjacent to each generator standby panelboard that serves teacher station receptacles and telecom room receptacles.

General receptacles will be ivory will ivory wall plates. Computer receptacles will be gray with gray wall plates. GFCI receptacles will be provided in outdoor locations, kitchen, and within six feet of any sink.

Three-phase motor loads will be provided with phase-loss protection.

Generator Power

The current MCPS standard is to provide emergency power for emergency/life safety systems and standby power for heat trace on heat pump water supply and return piping to dedicated outdoor air systems (DOAS) units and rooftop units on the roof in order to keep the pipes from freezing. The current MCPS standard also requires generator standby power to the freezer and cooler in the kitchen, IT systems, and other important equipment.

V. DESCRIPTION OF OPTIONS

A new outdoor generator will be required to satisfy these requirements. The new generator can be natural gas and located outside the building near the utility company transformer. Separate automatic transfer switches and panelboards will be required for the emergency and standby loads.

Standby panelboards connected to generator power will be placed in electrical closets to serve teacher station receptacles, telecom room receptacles, ATC/EMS panel(s), elevator cab, sumps pumps, smoke dampers, and heat trace for rooftop units.

Lighting

MCPS standard classroom lighting consisting of pendant-mounted lighting fixtures with linear fluorescent lamps will be provided. Offices, corridors, toilet rooms, storage rooms, and support spaces will have lensed type recessed fluorescent fixtures. Compact fluorescent or LED downlights will be provided where smaller fixtures are appropriate. Decorative lighting will be specified in selected spaces. Interior lighting fixtures utilizing LED technology will be considered where appropriate. High-bay lighting fixtures with compact fluorescent lamps will be provided in the gymnasium. Exterior building-mounted perimeter security lighting and pole-mounted parking lights will be full cut-off utilizing LED light sources.

Linear fluorescent type lighting fixtures that do not require dimming with utilize 32-watt, 3500K, T8 lamps and programmed-start electronic ballasts.

General lighting control will be provided by room lighting switching schemes with occupancy sensors for automatic shut-off control. Multiple switching will be provided for larger areas.

Lighting controls will meet the requirements of ASHRAE Standard 90.1-2010. Lighting controls in classrooms will include lighting room controllers to control 0-10V electronic dimming ballasts, daylight monitoring sensor for daylight harvesting, occupancy sensors, and multiple levels of lighting. Office lighting fixtures will either utilize two-level ballasts with bi-level control to provide 50% or 100% light output, or utilize 0-10V electronic dimming ballasts to provide multiple levels of light output when connected to a daylight monitoring sensor for daylight harvesting. Emergency lighting will be automatically switched on during a power outage.

Lighting levels will be designed in accordance with the recommendations of the Illuminating Engineering Society of North America (IESNA). The lighting power density will not exceed 0.99 watts per square foot per Table 9.5.1 of ASHRAE Standard 90.1-2010.

V. DESCRIPTION OF OPTIONS

Data and Voice Systems

The main telecommunications room will remain near the media center and intermediate telecom closets will be provided as required. The telecommunications infrastructure will include outlet boxes, conduits and raceways, surface metal raceways in the computer lab and for student outlets in classrooms, and conduit sleeves through walls and floors for the installation of the data and voice cabling. The number of telecom outlets in each room will comply with MCPS and Maryland State requirements. Existing outlets will be reused where feasible.

Intercom and Sound Systems

The existing public address/intercommunications head-end console in the school will be removed. The new public address/intercommunications head-end console will be located near the Media Center. The head-end equipment will have public address, intercom, master clock, and CD/audio functions.

Call switches and ceiling-mounted speakers will be provided in classrooms, gymnasium, dining room, selected offices, and support spaces. Ceiling-mounted public address speakers will be provided in corridors and large toilet rooms. Exterior building-mounted speakers will be provided near the front entrance, bus loop, and playground areas.

The gymnasium and dining room will have sound reinforcement systems per MCPS standards. The dance, fitness and music rooms will also have sound reinforcement systems.

Instructional/Classroom Technology

Classrooms will be equipped with dedicated computer receptacles connected to "clean power" computer panelboards. The teacher's desk receptacles will be connected to generator standby panelboards. An additional computer receptacle will be located at the front of the classroom off-center of the teaching wall for Promethean smart boards.

Security System

Door access control system card readers, in conjunction with electrified door hardware, will be provided at the building main entrance and selected exterior doors.

Intrusion detection will include ceiling-mounted motion sensors in the main office area, corridors and classrooms, and door contacts at exterior doors.

Video surveillance/CCTV system cameras will be provided in front of the main entrance and at other locations required by MCPS. Existing cameras will be reused where feasible.

Fire Alarm System

The existing fire alarm control panel with voice evacuation by Fire-Lite Alarms, located in the main electrical room, will remain and be utilized to serve the new fire alarm devices.

The new fire alarm annunciator with graphic display will be located in the vestibule of the main entrance. The graphic display will show the fire alarm zones. Zoning will follow the sprinkler zones, with separate zones for smoke detectors, heat detectors, manual pull stations, and water flow devices.

Manual pull stations will be located at the main entrance, main office, dining room, gymnasium, and exterior doors at kitchen and near loading dock. Smoke detectors will be provided on each side of a door with fire alarm magnetic door holders. Duct smoke detectors with remote test stations will be provided for air-handling systems where required, and will interface with the HVAC equipment for shutdowns. Each initiation device will have its own address.

Fire alarm combination speaker/strobe devices will be installed ceiling-mounted in classrooms and corridors, and will be installed wall-mounted in offices, media center, dining room, gymnasium, and toilet rooms. Notification appliance circuit (NAC) power extender panels will be provided where needed for speaker/strobe devices. Strobe spacing and locations will be per NFPA and ADA requirements for rooms and corridors.

V. DESCRIPTION OF OPTIONS

Option 1 - Description

Option 1 proposes a light modification by creating a new main entrance, relocating Administration to the ground floor main entrance. All interior finishes will be updated or replaced to create bright, vibrant, colorful spaces.

The program is squeezed to fit within in the current wall configurations, creating discrepancies with the program space summary. Also the desired program adjacencies are unable to be completely met.

The recently renovated Science Lab, art rooms, food service, dining, and gymnasium are kept in their current locations. The largest disruption to program adjacencies is keeping the science lab and art room in their current location. These rooms are located within the Needwood Academy. Their location will cause students from other academies and middle school students from the Fleet Street Academy to have to enter into their space to access these programs. In keeping as many interior walls as possible the circulation within each pod remains truncated and arduous. The current dining / food service relationship is unchanged. Currently students enter in the food service space, exit, and travel to the dining room through a public corridor. This relationship is not preferred.

With Administration removed from the second floor it leaves half of the second floor as un-programmed space.

All new infrastructure and systems will be designed to meet MCPS standards. These include the HVAC, life safety, fire protection, electrical, lighting, data and communication systems. The modified facility will comply with accessibility codes.

At some locations existing bearing walls need to be removed in order to accommodate the new layout. New spread footings, steel columns and beams will need to be provided to support the existing framing.

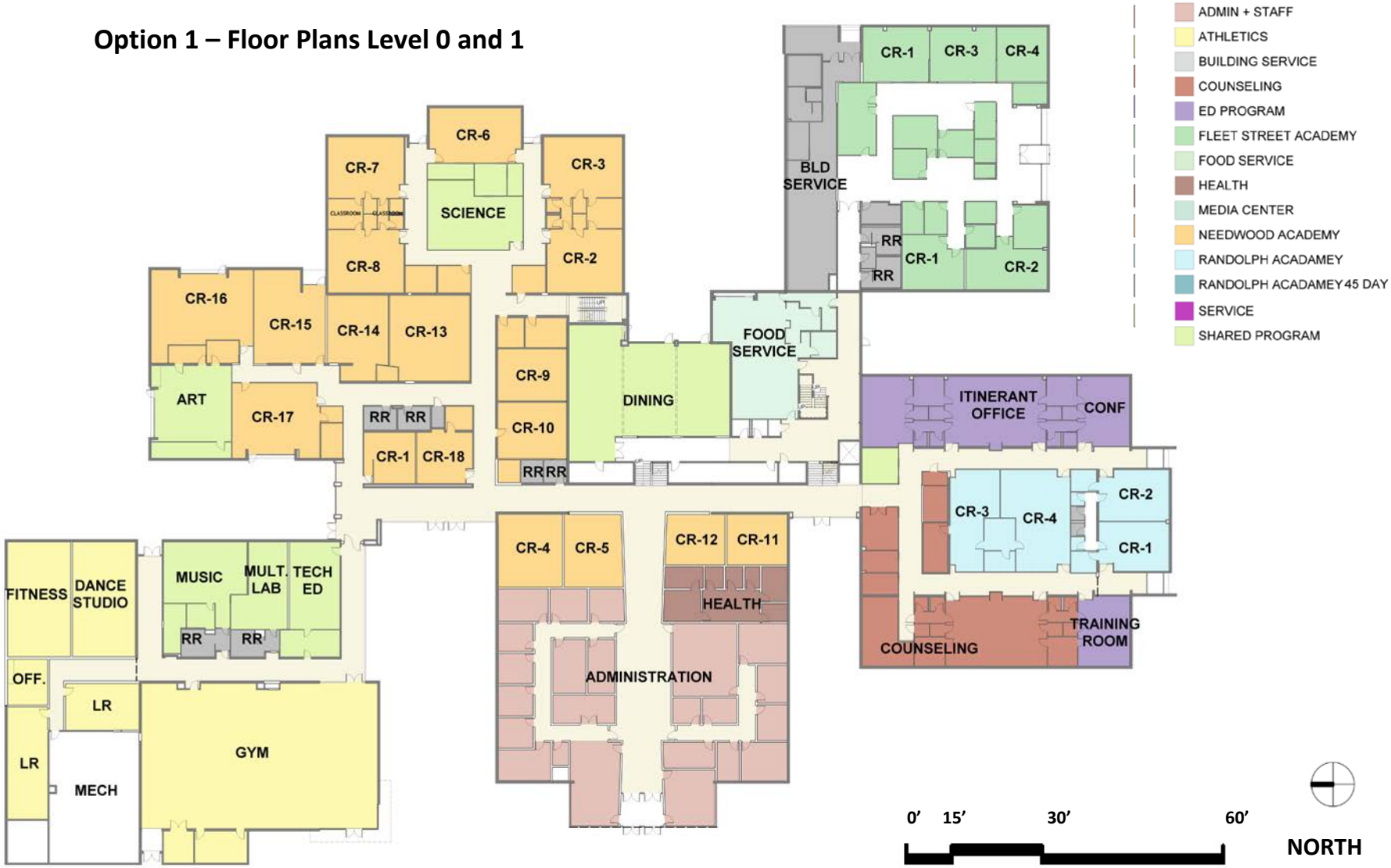
The existing pool area will need to be in-fill with soil and compacted in order to support the new slab on grade.

V. DESCRIPTION OF OPTIONS

Option 1 – Site Plan

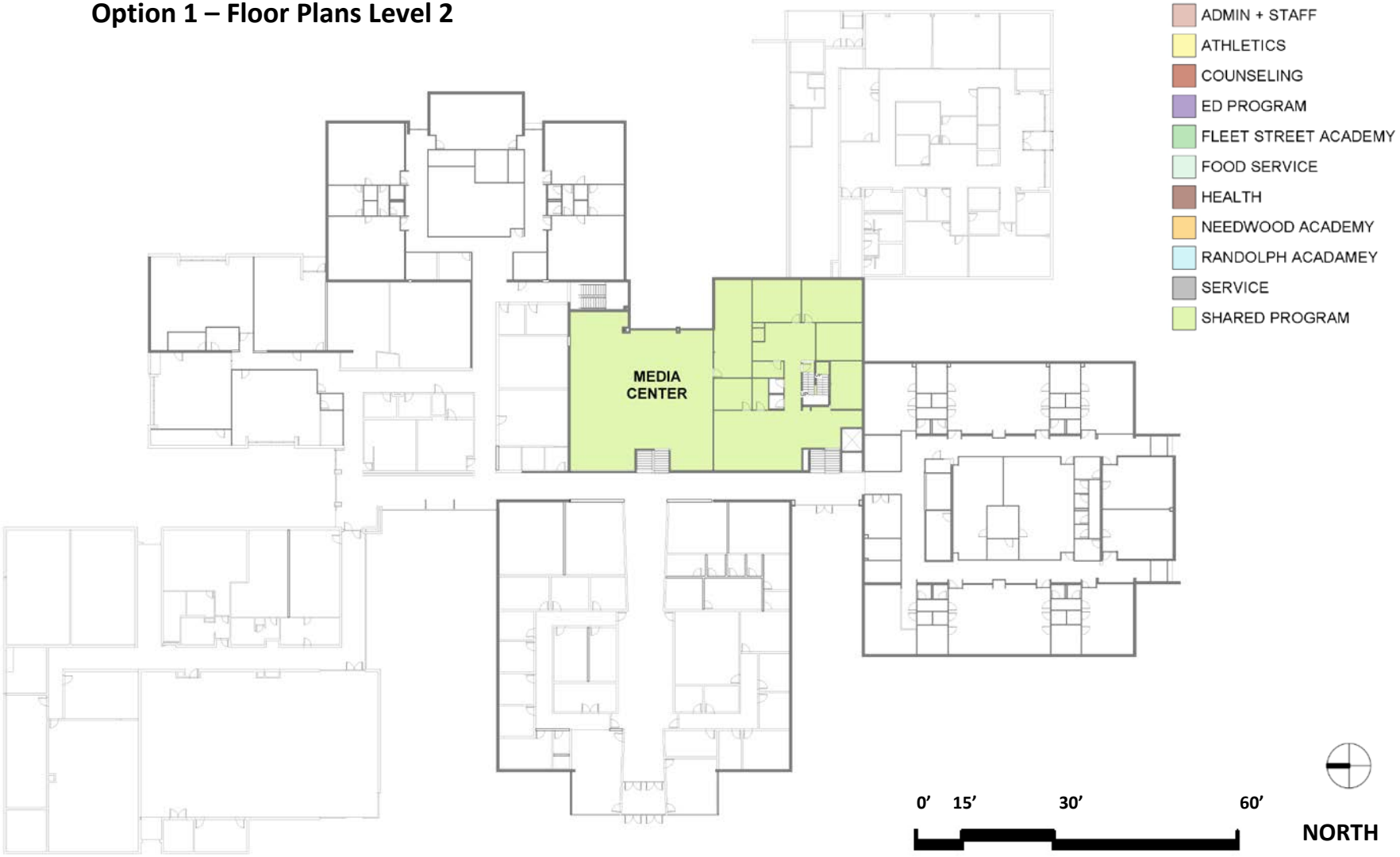
V. DESCRIPTION OF OPTIONS

Option 1 – Floor Plans Level 0 and 1



V. DESCRIPTION OF OPTIONS

Option 1 – Floor Plans Level 2



V. DESCRIPTION OF OPTIONS

Option 1 – Advantages & Disadvantages

Advantages:

- Identifiable Main Entrance
- Relocated Administration

Disadvantages:

- Some spaces do not meet the program space summary provide by MCPS
- Most program adjacencies cannot be met
- Student must enter academies to access shared core spaces, such as science and art.
- The dining / food service relationship remains disconnected.
- Interior Circulation is truncated and arduous.

V. DESCRIPTION OF OPTIONS

Option 2 - Description

Option2 proposes a medium modification by creating a new main entrance, relocating Administration to the main entrance. All interior finishes will be updated or replaced to create bright, vibrant, colorful spaces.

This option proposes more interior walls be demolished and reconfigured. This helps lesson the discrepancies with the program space summary, it also allows the Academies to become more distinct elements and improves program adjacencies.

The 2009 Science Lab renovation is kept, the art rooms, food service, dining, gymnasium are kept in their current location. The largest disruption to program adjacencies is keeping the science lab and art room in their current location. These rooms are located within the Needwood Academy. Their location will cause students from other academies and middle school students from the Fleet Street Academy to have to enter into their space to access these programs. However in this option more interior walls are rearranged within the Needwood Academy to create better circulation and adjacencies within the academy. There are two remain Needwood Academy classroom not within the core of the academy.

Renovations to another pod allow the Fleet Street Academy Classroom move to the exterior wall allowing some natural light in each classroom.

The biggest intervention is the creation of a light filled two story dining hall in the center of the building. The space provides a critical gathering space for the entire building and is central organizing element. This design move also corrects the student's circulation through food service directly into the Dinning.

All new infrastructure and systems will be designed to meet MCPS standards. These include the HVAC, life safety, fire protection, electrical, lighting, data and communication systems. The modified facility will comply with accessibility codes.

At some locations in the Lower Level existing bearing walls need to be removed in order to accommodate the new layout. New spread footings, steel columns and beams will need to be provided to support the existing framing.

The existing pool area will need to be in-fill with soil and compacted in order to support the new slab on grade.

A new stair will be provided at the north-east wall of the future food service area. The foundation system for this structure shall consist of conventional continuous footing on original earth and controlled compacted fill capable of supporting allowable soil bearing of 2000 psf. The walls shall be 12" reinforced CMU.

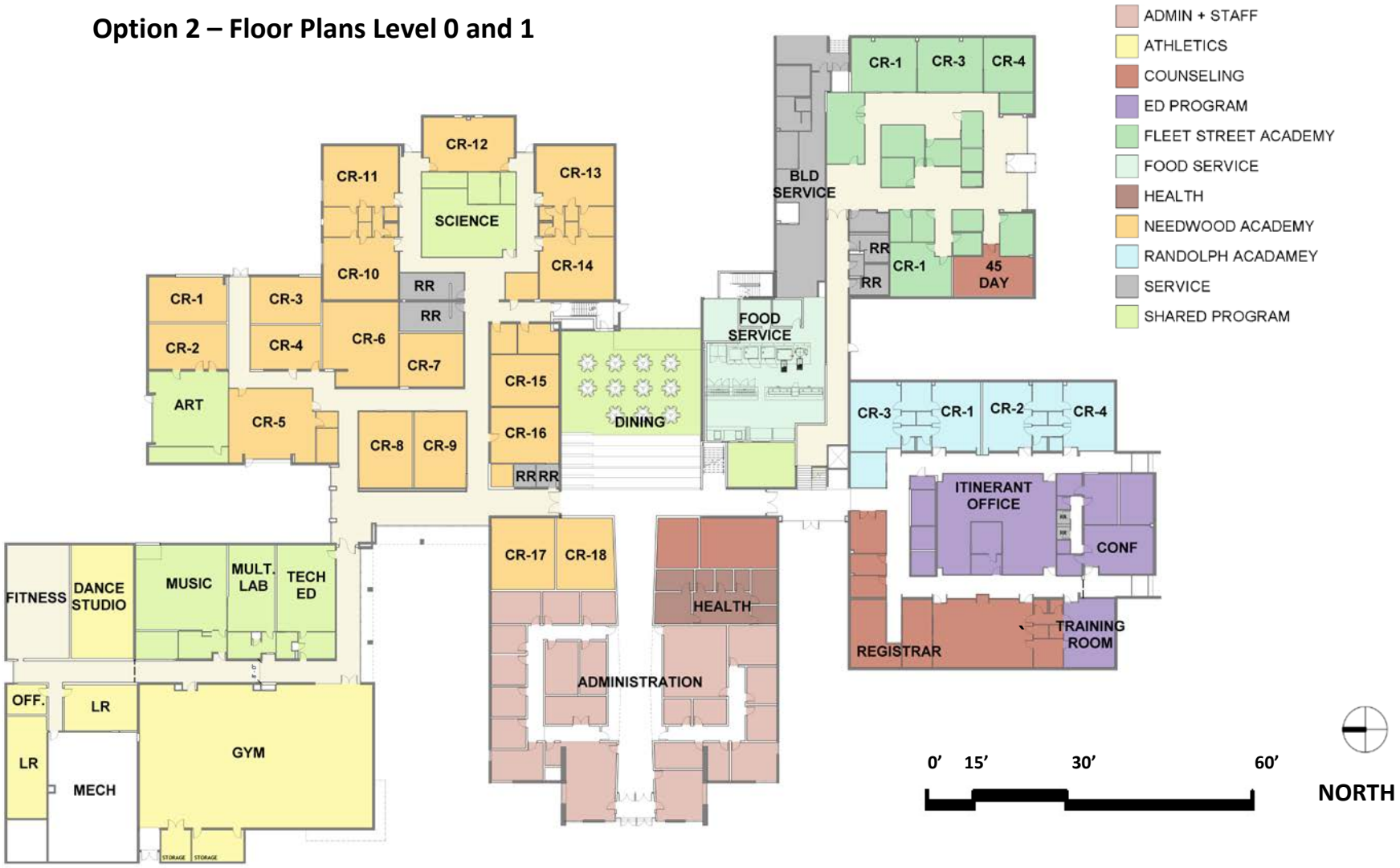
Portion of the existing upper level at building B will be removed in order to accommodate the new layout. The portion to be removed is where the existing Media Center is located. New bearing wall and steel frame will need to be provided.

V. DESCRIPTION OF OPTIONS

Option 2 – Site Plan

V. DESCRIPTION OF OPTIONS

Option 2 – Floor Plans Level 0 and 1



V. DESCRIPTION OF OPTIONS

Option 2 – Floor Plans Level 2

V. DESCRIPTION OF OPTIONS

Option 2 – Advantages & Disadvantages

Advantages:

- Identifiable Main Entrance
- Relocated Administration
- New light filled two story dining hall in the center of the building.
- Interior Circulation is improved.

Disadvantages:

- All program adjacencies cannot be met
- Student must enter academies to access shared core spaces, such as science and art.

V. DESCRIPTION OF OPTIONS

Option 3 - Description

Option 3 an extensive modification to the building by creating a new main entrance, relocating Administration to the ground floor main entrance. All interior finishes will be updated or replaced to create bright, vibrant, colorful spaces.

Option 3 also proposes the most extensive interior renovation. The 2009 Science Lab renovation and the current Art Room are relocated. These program spaces moved out of the Needwood Academy and are now accessible off a "Main Street" corridor that connects all of the academies. By relocating these rooms, the renovation meets the program space summary and creates the preferred adjacencies.

All academies classrooms in Option 03 are clustered around group study space and informal learning space outside the classroom. The corridors are able to widen create locker commons. These moves remove the institutional feel of the current building and provide students with 21st Century Learning Environments on par with their home school.

The biggest intervention is the creation of a light filled two story dining hall in the center of the building. The space provides a critical gather space for the entire building as a central organizing element.

All new infrastructure and systems will be designed to meet MCPS standards. These include the HVAC, life safety, fire protection, electrical, lighting, data and communication systems. The modified facility will comply with accessibility codes.

At the lower level in several locations existing bearing walls need to be removed in order to accommodate the new layout. New spread footings, steel columns and beams will need to be provided to support the existing framing. The existing pool area will need to be in-fill with soil and compacted in order to support the new slab on grade. A new stair will be provided at the north-east wall of the future food service area. The foundation system for this structure shall consist of conventional continuous footing on original earth and controlled compacted fill capable of supporting allowable soil bearing of 2000 psf. The walls shall be 12" reinforced CMU.

Portion of the existing upper level at building B will be removed in order to accommodate the new layout. The portion to be removed is where the existing Media Center is located. New bearing wall and steel frame will need to be provided.

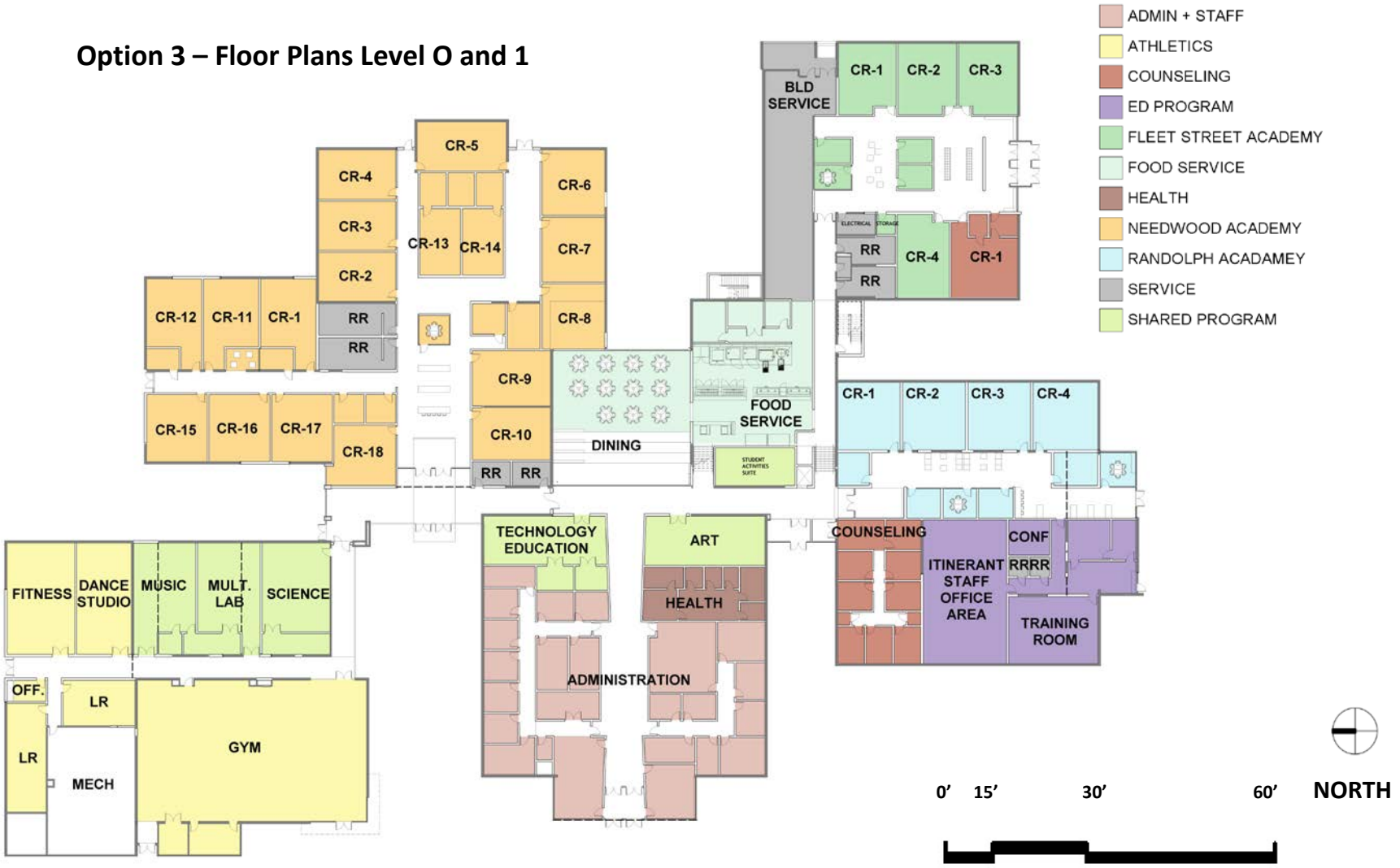
Option 3 also has a series of alternates, which if the budget allows will help mark the new main entry with a canopy, create a connections bewteen inside and out by enlarging and providing new windows, and provide outdoor learning envirnoments through carefully designed landscape features.

V. DESCRIPTION OF OPTIONS

Option 3 – Site Plan

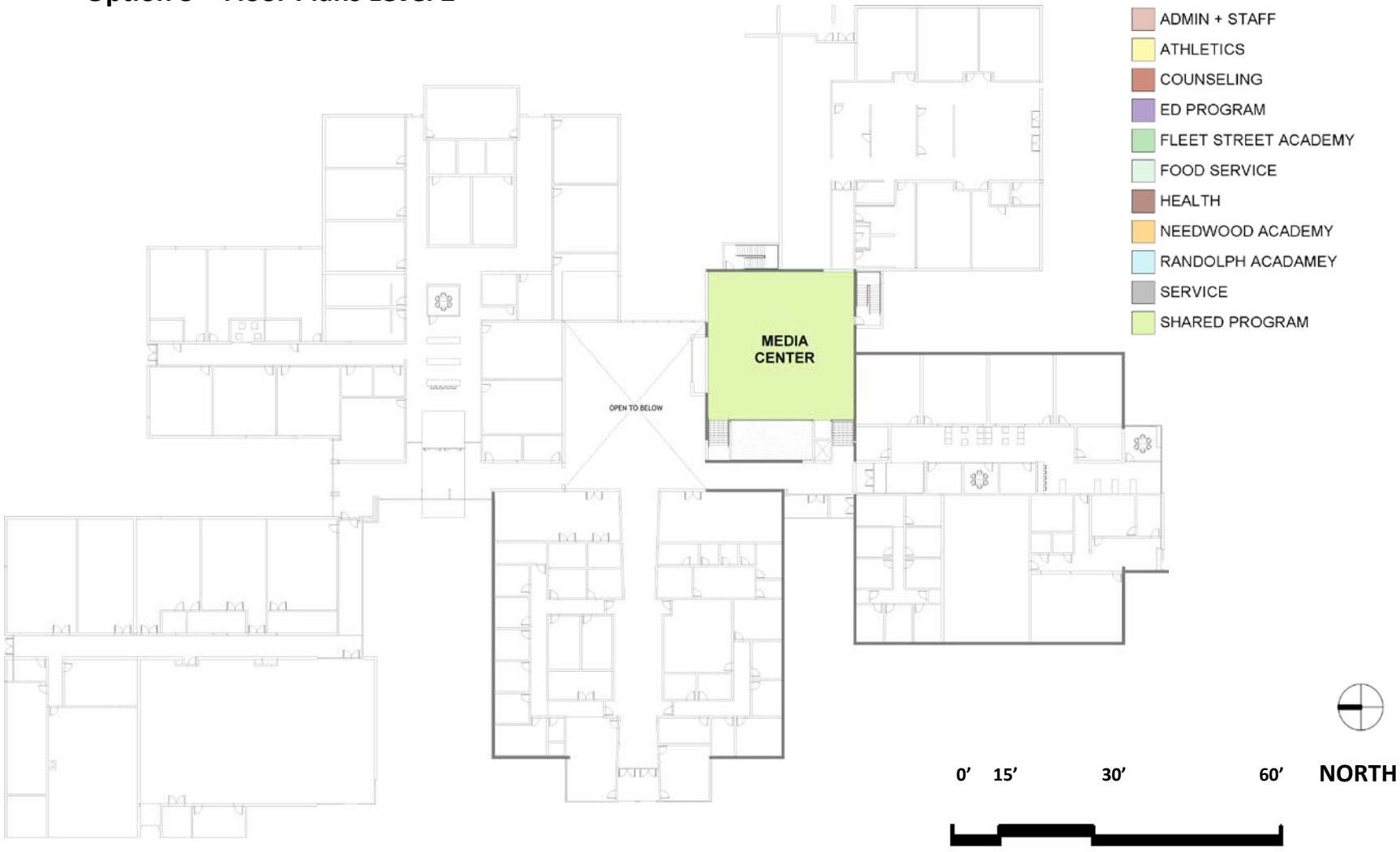
V. DESCRIPTION OF OPTIONS

Option 3 – Floor Plans Level O and 1



V. DESCRIPTION OF OPTIONS

Option 3 – Floor Plans Level 2



V. DESCRIPTION OF OPTIONS

Option 3 (Alternate) – Landscape Opportunities

A OUTDOOR PLAZA/DINING TERRACE

B RAIN GARDEN

C AGRICULTURAL EDUCATION AREA

D OUTDOOR CLASSROOM/ENTRY COURT

E WEATHER AND MUSIC GARDEN

F BUTTERFLY & BIRD HABITAT

V. DESCRIPTION OF OPTIONS

Option 3 – Advantages & Disadvantages

Advantages:

- Identifiable Main Entrance
- Relocated Administration
- New light filled two story dining hall in the center of the building.
- Interior Circulation is improved.
- All shared core program is located outside of the Academies.
- Group Study and Informal Learning Environments are incorporated into each Academy.

Disadvantages:

- Cost

Discussion of Options

The estimates for this comparison are based on current construction market conditions for both building and site. The estimates will be revised to reflect market conditions and prevailing construction costs when the project is included in the Capital Improvement Program for planning and construction funding.

In Option 1 the approach is to save as much of the existing building as possible and relocated the Administration to the main entry. Some of the spaces in Option 1 do not meet the program space summary provide by MCPS. Also the preferred program adjacencies cannot be met.

In Option2 more interior renovation is proposed. The Science Lab and Art Room are left in their current locations, however with more extensive renovation in this area all but two Needwood Academy classrooms are in their specific cluster. Also in Option 2 the Fleet Street Academy classrooms are moved to an exterior to providing these classrooms natural daylight. The biggest intervention is the creation of a light filled two story dining hall in the center of the building. The space provides a critical gathering space for the entire building and is central organizing element. This design move also corrects the student's circulation through food service directly into the Dinning. Some of the spaces in Option 2 do not meet the program space summary provide by MCPS. Also the preferred program adjacencies cannot be met.

Option 3 meets all of the requirements identified by the most extensive interior renovation. This option creates the best 21st Century Learning Environment for the students. Therefore, in accordance with the thoughts of the feasibility study participants, the design team recommends that the project moves forward with Option 3 as described in Section V.

END OF REPORT

APPENDIX A: SPACE ALLOCATION SUMMARY

When this project is complete, the following spaces are to be provided.

FACILITY	# NEEDED	SQ. FT./ FACILITY	TOTAL NET SQ. FT.
Standard Spaces			
Standard Classroom	28	600	16,800
Workrooms	2	75	150
Textbook Storage	1	600	600
Science			
Science Laboratories (Perimeter layout)	1	900	900
Preparation/Project Room	1	200	200
Art			
Art Room	1	900	900
Art Storage	1	250	250
Music Suite			
Music Room	1	900	900
Practice Room	1	80	80
Multimedia Laboratory	1	900	900
Instrumental Storage	1	250	250
Technology Education			
Technology Education Laboratory	1	900	900
Storage	2	100	200
Physical Education/Athletics			

Gymnasium	1	3,700	3,700
General Storage	2	150	300
Dance Room	1	900	900
Weight Room	1	900	900
Locker Area	2	900	1,800
Coach's Office	1	100	100
Instructional Media Center			
Main Resource Area	1	1,800	1,800
Materials Preparation/Office Area	1	400	400
Media Storage	1	300	300
Textbook Storage	1	200	200
Telecommunication Equipment Closet	1	150	150
Student Activities Facilities			
Student Council Suite	1	200	200
School Store	1	200	200
Journalism Staff Rm.	1	200	200
Staff Offices			
IT Systems Specialist Office	1	150	150
Speech & Language	1	250	250
OT/PT Room	1	250	250
Internship Coordinator	1	150	150
Staff Offices	6	150	900
Resource Teacher Offices	7	100	700
Administration Suite			
General Office	1	375	375
Principal's Office	1	250	250
Coordinator's Office	1	150	150
Staff Offices	4	150	600

Financial Assistant	1	150	150
Small Conference Room	2	300	600
Large Team/Testing Room	1	900	900
Storage	1	100	100
Paper Storage	1	150	150
Testing Room	1	200	200
Parent Room	1	100	100
Toilet Room	1	60	60
Office Workroom	1	300	300
Health Suite			
Waiting Room	1	100	100
Treatment/Medication Room	1	120	120
Office/Health Assessment Room	1	100	100
Health Assessment/Isolation Room	1	100	100
Rest Areas	2	100	200
Storage	1	40	40
Toilet Rooms	1	60	60
Crisis Intervention Areas			
Crisis Rooms	4	150	600
Interview Rooms	4	100	400
Counseling Suite			
Waiting Room	1	200	200
Counselors' Office	1	150	150
Social Worker's Office	5	150	750
School Psychologist Office	1	150	150
Pupil Personnel Worker	1	150	150
Records Room	1	150	150
Registrar's Office	1	150	150

School Security Office	1	250	250
Staff Room	1	900	900
Food Services Facilities			
Student Dining	1	1,500	1,500
Serving Area	1	300	300
Walk-in Cooler/Freezer	1	155	155
Dry Storage	1	192	192
Office	1	100	100
Toilet Room	1	70	70
Preparation Area	1	555	555
Building Services Facilities			
Building Services Office	1	150	150
Locker/Shower Area	1	250	250
Plant Equipment Operator Office	1	75	75
Compactor/Trash Room	1	250	250
Receiving and Storage Area	1	800	800
General Storage Rooms	3	250	750
Building Services Outdoor Storage			
Total for Alternative Programs			**50,232**
ED Program Offices			
General Office/Waiting Area			
Administrative Office	1	150	150
Director's Office	1	250	250
Itinerant Staff Office Area (18 desks/file cab.)	1	1800	1,800
Conference Room	1	300	300
Special Education Training Room			

Total for ED Program Offices			
TOTAL			**52,732**

APPENDIX B: Alternative Program Overview

Montgomery County Public Schools (MCPS) operates six alternative programs for middle and high school students who aren't reaching their full potential in their home schools for a variety of reasons. Alternative Programs (AP) strives to provide the proper connection for our learners who have been disconnected in some way during their educational experience in comprehensive schools. Alternative Programs provides supports and services that promote success for all students through academic and personal growth.

Considered Level 2 and Level 3 intervention and prevention services, each program is designed to meet the unique needs of its students. The alternative education programs provide direct academic instruction as well as services that address the emotional, intellectual, social, and physical demands of adolescence. The programs offer closely supervised and skillfully structured classes, allowing for decisive feedback from and immediate interventions by staff members. Differentiated instruction is done in small classes so students can fully access the curriculum.

Social skills training and behavioral strategy development are infused into the traditional MCPS and MSDE curriculum. The behavior management system follows the principles of Positive Behavior Interventions and Supports (PBIS). This includes proactive strategies for defining, teaching, and supporting appropriate student behaviors. In addition to academic and behavioral interventions, the programs offer counseling, social work services, case management, parent outreach, and community partnerships. The goal of each program is to help students return to and function effectively in their comprehensive secondary home schools.

Currently the Blair G. Ewing Center houses four secondary alternative school programs for middle and high school students.

Needwood Academy

Needwood Academy Alternative Program is the consolidated high school alternative program and is operated for high school students who are not achieving at their potential for a wide variety of reasons, usually including behavior, academic and/or attendance problems. Students are referred through the home school CPS team and facilitated by the referring school pupil personnel worker (PPW). The program provides academic instruction in coursework for credits toward a high school diploma. In addition, a behavioral/social skills component is infused into the curriculum to teach social skills necessary to return to home schools and succeed.

Phoenix Program

The Phoenix Program is a structured recovery program for high school students, grades 9-12, with substance abuse problems that interfere with school attendance, performance, and behaviors. Students can be referred directly by agency drug treatment partners or through the home school CPS. The referral process is facilitated by the pupil personnel worker (PPW) and includes required written documentation from the student's treatment provider. Student participation in the home school level 1 program is not a requirement for Phoenix students. The Phoenix Program includes academic instruction in courses for credit toward a high school diploma. A drug-free environment is maintained through weekly urinalysis and group counseling on recovery. In addition, high adventure activities and a community service component foster self-esteem and team building in drug-free activities. Phoenix is not a treatment program; rather it is a support program for students in treatment or immediately after treatment.

Randolph Academy

Randolph Academy serves students in grades 9-12 who have been involved in a serious disciplinary action that warranted a recommendation for expulsion. Students are placed by the Chief Operating Officer's office in lieu of expulsion. The placement process is facilitated by the referring school's pupil personnel worker (PPW). The program provides an academic program in courses for credit toward a high school diploma. Special education students who have been expelled are also placed here. Students utilize direct teacher instruction along with Distance Learning during a modified school day schedule. The program provides small structured, classes, close supervision, direct instruction in behavioral skills and immediate reinforcement to students. In addition to differentiated academic and behavioral interventions, the program also offers counseling, case management services, parent outreach, and frequent progress monitoring. The intent of the program is to help students return to and function effectively in their home comprehensive secondary school. The program provides transportation for the morning and afternoon session.

Fleet Street Middle School Program

Fleet Street Middle School program serves students grades 6-8 who have been involved in a serious disciplinary action that warranted a recommendation for expulsion. Students are placed by the Chief Operating Officer's office in lieu of expulsion. The referral process is facilitated by the referring school's pupil personnel worker (PPW).The program provides academic instruction in courses leading to completion of grade level objectives and promotion. In addition, a behavioral/social skills component gives students the skills necessary to return to their home schools and succeed. Special education students who have been expelled are also placed here. The program provides structured, smaller classes, close supervision, direct instruction in behavioral skills and immediate reinforcement to students. In addition to differentiated academic and behavioral interventions, the program also offers counseling, case management services, parent outreach, and frequent progress monitoring. The intent of the program is to help students return to and function effectively in their home comprehensive secondary school.

APPENDIX C: EXISTING CONDITIONS SURVEY AND CODE ANALYSIS

SITE

SIZE OF SITE

The existing Blair G. Ewing facility is situated on a 22.54 acre parcel at 14501 Avery Road Rockville, MD 20853. The site is bounded to the West by Rock Creek , to the South by Norbeck Rd , to the East by Aery Rd and Red Gate Golf Course and to the North athletic fields ran by Montgomery County Recs and Parks.

SITE FEATURES

The site is slopes toward the West and Rock Creek. The boundaries of the center's property have very mature, dense trees that create a beautiful setting for the school. The site slope allows for on grade access to the lower level of the building.

There are four curb cuts that provide access to the different "pod" of the center and the 147 (5 ADA) designated parking spaces for vehicles and two bus loops. Currently the bus loops are integrated within the existing parking and are not separate loops. The service road, loading dock, and trash area is located along the western side of the school. Currently the center's main entrance is tucked away in the southwest corner of the building.

View West

East Court Yard adjacent to the current Dining Room.

EXISTING CONDITIONS SURVEY

ARCHITECTURAL

The building exterior is brick with aluminum storefront and aluminum copings. The brick is generally in good condition, with some areas of cracking due to expansion. Effervescence is seen on portions of the exterior, this is more than likely caused by the lack of an air cavity in the wall's construction. No expansion joints in the brick were observed. Windows and Storefront systems are aluminum. Sealant around the windows has failed. The window sills are brick and have worn overtime. The site masonry walls along the East side of the building have degraded overtime.

The current building entry is hidden on the lower level in the SE corner of the building away from the main Administration Offices. Offices, classrooms, building services, food service and dining are all located on this level. This level is connected by multiple stairs to both the first floor and the second. Currently all of these stairs are open on at least one floor. To meet current code some of these stairs will have to be enclosed or relocated.

The building interior is primarily masonry walls with some gypsum board walls, vertical wall systems covered in aged tectum panels. At entry points along the building the dark exterior brick is brought into the interior. Ceilings are predominately acoustical tile. Floors are a VCT with carpet in the Media Center. Most classrooms have folding partitions between them and none were observed to be working. Between each set of classrooms exists offices, storage and single restrooms. The Restrooms are not code compliant and because they are only accessible from the classroom their use interrupts class. Interior doors are wood and the door hardware is not accessible. Also, many doors do not have proper ADA clearance. Lockers are located in the corridors. There are currently multiple small student dining rooms. Currently none of these rooms are directly connected to the Kitchen or food service areas. The Media Center is located on the second floor and is open to the main corridor. This connection provides good visual connections, but the acoustical separation is non-existent.

EXISTING CONDITIONS SURVEY

The original gymnasium has a wood floor, steel joists. A storage room has been turned into a weight room. The original pool has been shut down for some time. The room remains locked and inaccessible to students and staff. The locker rooms and toilets are adjacent to the gymnasium. The showers have been converted to storage areas.

EXISTING CONDITIONS SURVEY

STRUCTURAL

A. **FOUNDATION SYSTEM:** According to the existing construction documents, the foundation system for all six (6) buildings consists of conventional spread footings at columns and continuous footings under all bearing walls. The foundations were placed on original earth or controlled compacted fill capable of supporting an assumed allowable soil bearing value of 4000 psf. Footings appeared to be placed at a minimum of 2'-6" below finished grade around the entire building perimeter. Foundation retaining walls are 8" or 12" reinforced concrete.

B. **FIRST FLOOR FRAMING SYSTEM:** The lower level floor for all six (6) buildings consists of a 4" concrete slab on grade reinforced with 6" x 6"- 10/10 welded wire fabric poured over a vapor barrier over 4" of porous gravel fill per construction documents.

C. **SECOND LEVEL FRAMING SYSTEM AT BUILDING B:** The framing system consists of 2½" total thickness concrete slab reinforced with 6"x6"-10/10 welded wire mesh over form deck. The slab spans 2'-0" between steel bar joists that are supported at the interior of the building by 8" block corridor walls or steel beams per construction documents.

D. **ROOF FRAMING SYSTEM:** The framing system consists of 1 1/2" X 22 gauge metal roof deck which shall span 6'-0" o/c maximum between steel bar joists that are supported at the interior of the building by 8" block corridor walls or steel beams.

Based on field observations of the areas mentioned above and review of the existing drawings and to the best of CMJ's knowledge and belief, it is CMJ's professional opinion that there are no evidences to suggest that the portions exposed to view were not built per the contract documents.

EXISTING CONDITIONS SURVEY

MECHANICAL

General

The Blair G. Ewing Center facility was originally constructed in 1971. It appears that a majority of the mechanical equipment that currently exists within the building dates back to the building's original construction, with the exception of select components such as the domestic water heaters. The following is a detailed description of the existing mechanical, plumbing, and fire protection systems.

Heating System

Two gas-fired three-pass cast iron sectional boilers produce heating water for the building. Based on the State of Maryland boiler inspection forms located within the mechanical room, these boilers were installed in 1971 and appear to be in fair working condition. Manufactured by Burnham (Model 4FW-209-50-G-GP), this equipment has a gross output rating of approximately 1,400 MBH per boiler. While the existing boilers are functioning adequately to satisfy the heating demands of the existing school, there does not appear to be surplus capacity available to support any additional building areas without losing standby capacity in the event one boiler fails. Currently each boiler is provided with dual low-water cut-off valves. Flues from each boiler extend individually through the boiler room roof. Boilers are currently equipped with gas-fired Gordon-Piatt burners supplied from the existing 2-PSI gas service entrance located adjacent to the boiler room area. These burners do not appear original to the equipment, as the original construction documents for the facility indicate fuel oil type burners for each boiler. Abandoned fuel oil piping is capped within the mechanical room, with no apparent fuel oil tank currently provided for the facility. The gas train for each boiler is provided with two gas shutoff valves for CSD-1 compliance. The combustion air opening provided for the mechanical room does not comply with current code requirements for combustion air.

Heating water is supplied to the building's four-pipe distribution system through two base-mounted end-suction pumps. Manufactured by Bell & Gossett (Model 1510), these pumps are located within the mechanical room and equipped with 15 HP constant speed motors. Both pumps appear to be in fair working condition, with one of the pump motors appearing recently replaced. Heating water pumps are arranged in a lead/lag setup with only one pump operating at any given time. The heating water distribution system is equipped with an air separator, shot feeder, and a horizontal expansion tank supported from the overhead structure. A three-way automatic temperature control valve is provided within the heating water distribution system for temperature reset control functions.

Cooling System

EXISTING CONDITIONS SURVEY

A single water-cooled centrifugal chiller manufactured by York (Model YTE3E3B2-CGG) is located within the mechanical room, generating chilled water for the building's four-pipe distribution system. This machine appears to be in fair working condition and was operational during our site visit. The machine is equipped with a turbo-modulator electrical cabinet, utilized for chiller operation and capacity control. The chiller utilizes R-123a refrigerant, is mounted on a concrete pad, and is equipped with vibration isolators between the concrete pad and chiller base. For safety purposes, a refrigerant monitoring system is provided within the mechanical room for detection of refrigerant leaks. It is anticipated that there is no excess chiller capacity to support any planned renovations or additional building area.

Similar to the heating water system, chilled water is supplied to the building's four-pipe distribution system through two base-mounted end-suction pumps. Manufactured by Bell & Gossett (Model 1510), these pumps are located within the mechanical room, equipped with 25 HP constant speed motors, and appear to be in fair condition. Chilled water pumps are arranged in a lead/lag setup with only one pump operating at any given time. The chilled water distribution system is equipped with an air separator, shot feeder, and a horizontal expansion tank supported from the overhead structure.

A single forced-draft cooling tower manufactured by Marley (Model Compac II Tower) is located outdoors within a masonry enclosure adjacent to the mechanical room. The tower is mounted on concrete piers, with vibration isolation provided between the tower base and piers. Outdoor condenser water piping is constructed from PVC and is provided without heat trace. A three-way condenser water control valve and associated cooling tower chemical treatment system are located within the mechanical room and positioned adjacent to the condenser water pumps. The cooling tower and chemical treatment system appear to be in good working condition.

Condenser water is distributed between the chiller and cooling tower systems through two base-mounted end-suction pumps. Manufactured by Bell & Gossett (Model 1510), these pumps are located within the mechanical room, equipped with 10 HP constant speed motors, and appear to be in fair condition. "Y"-type strainers are provided at the inlet of each pump, helping to alleviate debris from entering the pump inlets. Condenser water pumps are arranged in a lead/lag setup with only one pump operating at any given time.

In addition to chilled water, direct expansion (DX) type cooling is provided for systems serving both the media center and information technology (IT) areas located throughout the school. Spaces served by DX space conditioning typically require cooling operation at times when chilled water is not available.

<u>HVAC Systems</u>

EXISTING CONDITIONS SURVEY

The heating, ventilating, and air conditioning (HVAC) systems vary throughout the building. These systems were primarily installed as part of the building's original construction and appear to be in fair to poor working condition. The following is a breakdown of the various spaces and their associated HVAC system:

- Typical Classroom: Classroom areas are heated and cooled through console-type fan coil units with chilled water cooling and hot water heating, connected to the building's four-pipe chilled and heating water distribution systems. Manufactured by Trane, these units are located along the perimeter of each classroom area and are in fair to poor working condition. Damage to fan coil unit casing and internal components (coils, fans, etc.) was common throughout the facility. Ventilation air for classroom areas is supplied from an air air-handling unit provided for each classroom wing of the building. Manufactured by Trane, these air-handling units are provided with chilled water cooling, hot water heating, and appear to be in fair working condition. Supply airflow from these systems is ducted to a series of slot diffusers, integrated into the existing lighting systems. Excess ventilation is transferred through open slots within the light fixtures and into the ceiling plenum located above.

- Computer Lab: The computer lab area is provided with heating and cooling in a similar manner as the remaining classroom areas. Refer to the *Typical Classroom* section of this study for a description of the HVAC systems associated with these areas. No apparent supplement DX cooling is provided for this area.

- Cafeteria Area(s): An indoor single-zone constant volume air-handling unit provides space conditioning and ventilation for the cafeteria area(s). Manufacturer's name plate data for this air-handling unit, as well as other building air-handling unit systems, was not apparent based on our site visit. The cafeteria air-handling unit system is located within a lower level storage room adjacent to the elevator machine room. No return fan is currently provided for this system. This unit is supported from the overhead structure and appears to be in poor condition. Significant casing corrosion and airflow leakage was apparent during our site visit. Heating and cooling for this unit is provided by the building's four-pipe distribution systems, with a significant quantity of surface rust noted on the piping systems located near the unit. An inline circulator pump is provided on the unit's heating coil to safeguard against airflow stratification during the winter months. Supply airflow from this system is ducted to a series of slot diffusers, integrated into the existing lighting systems. Return air is transferred through open slots within the light fixtures and returned either back to the unit or into the kitchen area for exhaust air make-up purposes.

  Heating and cooling for perimeter cafeteria areas is accomplished through a series of console-type fan coil units, complete with chilled water cooling and hot water heating. Similar to the air-handling unit system, these fan coil units are in fair to poor working condition with damage noted at the unit casing.

EXISTING CONDITIONS SURVEY

- Staff Lounge: An indoor single-zone constant volume air-handling unit provides space conditioning and ventilation for the staff lounge area. Manufacturer's name plate data for this air-handling unit, as well as other building air-handling unit systems, was not apparent based on our site visit. The staff lounge air-handling unit system is located within a lower level storage room adjacent to the elevator machine room. No return fan is currently provided for this system. This unit is supported from the overhead structure and appears to be in poor condition. Heating and cooling for this unit is provided by the building's four-pipe distribution systems, with a significant quantity of surface rust noted on the piping systems located near the unit. An inline circulator pump is provided on the unit's heating coil to safeguard against airflow stratification during the winter months. Supply airflow from this system is ducted to a series of slot diffusers, integrated into the existing lighting systems. Return air is transferred through open slots within the light fixtures and returned either back to the unit or into the kitchen area for exhaust air make-up.

  Heating and cooling for the perimeter areas of the staff lounge is accomplished through a series of console-type fan coil units, complete with chilled water cooling and hot water heating. These fan coil units are located within a metal enclosure and are in fair to poor working condition.

- Kitchen: Heating for the kitchen area is accomplished through a hydronic unit heater, positioned at the ceiling level of the kitchen. This unit heater appears old and in poor condition. No air-conditioning is currently provided. Major kitchen equipment includes two stacked convection ovens positioned below a Type 1 (grease type) kitchen hood. This hood appears significantly oversized for the current cooking needs of the school, with make-up air transferred from the cafeteria and staff lounge areas. Walk-in boxes within the kitchen area are currently abandoned and appear to be in very poor condition. The kitchen office is provided with heating and cooling through a console-type fan coil unit located directly below the perimeter window.

- Gymnasium: The gymnasium area is served by three indoor four-pipe constant volume air-handling units, supported from overhead and located within the truss space of the gymnasium. Manufacturer's name plate data for these air-handling units, as well as other building air-handling unit systems, was not apparent based on our site visit. Air-handling unit systems are equipped with chilled water cooling coils and hot water heating coils, connected to the building's four-pipe distribution system. Supply airflow from each unit is ducted to a single round supply diffuser, positioned overhead within the gymnasium area. Return grilles are positioned low within the space and ducted back to the associated air-handling unit.

- Locker Room Areas: Both the men's and women's locker room areas are currently provided with heating and exhaust air only. Make-up air for these areas is transferred from the adjacent gymnasium area. Heating for locker rooms is provided with a series of Trane hot water propeller unit heaters, installed below the finished ceiling. All unit heaters appear to be in poor condition based on our site visit.

EXISTING CONDITIONS SURVEY

- Pool Area: An indoor single-zone constant volume heating-only air-handling unit provides space conditioning and ventilation for the pool area. Manufacturer's name plate data for this air-handling unit, as well as other building air-handling unit systems, was not apparent based on our site visit. The pool air-handling unit system is located within the main mechanical room, supported from the overhead structure, and in poor condition. Heating for this unit is provided by the building's four-pipe distribution systems. An inline circulator pump is provided on the unit's heating coil to safeguard against airflow stratification during the winter months. Supply and return airflow from this system is ducted to a series of air devices located throughout the pool area.

  A gas-fired copper fin boiler is provided within the mechanical room for pool water heating. Manufactured by Lochinvar (Model CPL1260), this equipment has a gross output rating of approximately 1,260 MBH and is in poor condition. The flue from this boiler extends to a masonry breaching within the mechanical room. A single inline pump and piping loop is provided for circulating water from the pool area through the boiler.

- Art Classroom Area: The art classroom area is provided with heating and cooling in a similar manner as the remaining classroom areas. Refer to the *Typical Classroom* section of this study for a description of the HVAC systems associated with this area. A single kiln is provided within the art classroom, with a dedicated capture hood provided near this equipment. However, the kiln is currently not positioned below this hood and should be relocated.

- Music Classroom: An indoor single-zone constant volume air-handling unit provides space conditioning and ventilation for the music classroom area. Manufacturer's name plate data for this air-handling unit, as well as other building air-handling unit systems, was not apparent based on our site visit. The music classroom air-handling unit system is located within a storage area, positioned adjacent to the area served. No return fan is currently provided for this system. This unit is supported from the overhead structure and appears to be in poor condition. Heating and cooling for this unit is provided by the building's four-pipe distribution systems. An inline circulator pump is provided on the unit's heating coil to safeguard against airflow stratification during the winter months. Supply airflow from this system is ducted to a series of slot diffusers, integrated into the existing lighting systems. Return air is transferred through open slots within the light fixtures and return back to the unit through the overhead ceiling plenum.

- Media Center: The media center area is conditioned through a variety of equipment, including perimeter fan coil units, an indoor air-handling unit, and two rooftop units. A series of console-type fan coil units with chilled water cooling and hot water heating provide space conditioning for the perimeter areas of the media center. Ventilation air for the media center and associated support offices is supplied from an existing air-handling unit, located within a storage room adjacent to the upper level administration area.

EXISTING CONDITIONS SURVEY

Manufactured by Trane, this air-handling unit is provided with chilled water cooling and hot water heating. This unit is supported from the overhead structure and appears to be in poor condition. Supply airflow from this system is ducted to a series of slot diffusers, integrated into the existing lighting systems. Excess ventilation is transferred through open slots within the light fixtures, into the ceiling plenum, and back to the unit.

Two packaged rooftop units with direct expansion cooling provide supplemental cooling for the media center area. Manufactured by Carrier (Model 50TJ-05-501GA), these units appear to be in good working condition and were operational at the time of our site visit. Supply air is ducted from each rooftop unit to a four-way distribution plenum, located within the media center ceiling. Room airflow is returned back to these units through a ceiling-mounted return grille within the media center area.

- MDF Room (Located adjacent to the Media Center area): An indoor Trane fan coil unit, complete with direct expansion cooling, provides space conditioning for the MDF room. This unit is in poor condition and was not operational at the time of our site visit. Since this unit was not operational, the room temperature was very hot. It is recommended that the operation of this unit be restored as soon as possible to reduce the current room temperature and avoid damage to the server equipment currently located within this space.

- Administration and Health Suite: The administration and the health suite areas are heated and cooled through console-type fan coil units with chilled water cooling and hot water heating, connected to the building's four-pipe chilled and heating water distribution systems. Manufactured by Trane, these units are located along the perimeter of each office or administrative support area and are in fair to poor working condition. Ventilation air for administrative and the health suite area is supplied from air-handling units located within storage rooms adjacent to the administration areas. Manufactured by Trane, these air-handling units are provided with chilled water cooling and hot water heating. Each unit is supported from the overhead structure and appears to be in poor condition. Supply airflow from these systems is ducted to a series of slot diffusers, integrated into the existing lighting systems. Excess ventilation is transferred through open slots within the light fixtures and into the ceiling plenum.

- Building Exhaust Systems: A combination of roof-mounted and inline fans remove exhaust air throughout the building. These fans were installed as part of the original building construction and appear to be in fair to poor working condition.

EXISTING CONDITIONS SURVEY

Control System

The existing control system for the school is primarily comprised of pneumatic control components, with select system components provided with electronic or electric controls. Major valve and damper components are provided with pneumatic operation. Select building infrastructure

control components are interfaced with the central MCPS energy management control system for occupied/unoccupied settings. A DeVilbiss duplex air compressor system, complete with horizontal storage tank, is located within the mechanical room and serves the building's pneumatic control components. Air supplied from this compressor is fed through a refrigerated dryer. This air compressor system appears to be in good working condition; however, the refrigerated dryer appears old and in fair condition.

Plumbing Systems

The building is served from the county water system through a 6-inch combination fire and water service, entering the building within the main mechanical room. A 3-inch domestic water main extends from this service to support the building's domestic water requirements. Currently, no backflow preventer is provided at the domestic water service entrance. While this may have been acceptable at the time the system was installed, it does not meet current plumbing code requirements. It is anticipated that limited surplus capacity exists for the existing 3-inch domestic cold water main.

Domestic hot water is generated by a 200-gallon gas-fired water heater, manufactured by A.O. Smith (Model BTP200-300). Based on the State of Maryland water heater inspection form located within the mechanical room, this equipment was installed in 1996 and appears to be in good working condition. This heater is equipped with a 300 MBH gas burner that produces 291 gallons per hour recovery. The flue from this water heater extends to a masonry breaching within the mechanical room. The system is equipped with a domestic water circulation pump; however, no thermostatic mixing valve or expansion tank is currently provided. It is anticipated that limited surplus capacity exists for the hot water heater.

Plumbing fixtures throughout the school appear to be in good condition and recently replaced. The water closets are floor-mounted, urinals are wall-hung, and the lavatories are individual wall-hung type. Restroom areas throughout the school are designed for a single occupant, with no group restrooms currently provided (other than the locker room areas).

EXISTING CONDITIONS SURVEY

Fire Protection System

A majority of the existing school is provided with sprinkler coverage, with the exception of the lower level administration areas. Located within the mechanical room, a 6-inch fire line extends from the incoming water service and is provided with a 6-inch double-check type backflow preventer. This fire line serves two zone valve assemblies, both located within the mechanical room. Sprinkler mains extend from each zone valve assembly and serve sprinkler heads located throughout their respective zone. Sprinkler coverage is currently provided without the need for a fire pump. Sprinkler system components appear in fair condition. The existing 6-inch combination fire and water service appears adequately sized to support any planned modifications to the existing school.

EXISTING CONDITIONS SURVEY

ELECTRICAL

General

The Blair G Ewing Center was originally constructed in 1971 (85,400 square feet), with only minor changes to the facility and the electrical systems. The one major system that has been upgraded is the fire alarm system that was upgraded in 2012. The electrical equipment that currently exists within the building is in generally fair working condition. The following is a detailed description of the existing electrical, lighting, communications, security, and fire alarm systems.

Power Distribution

The school's electrical service is fed from a Pepco utility service. A primary utility feeder is run underground in direct-buried conduit to the primary section of a pad-mounted Pepco utility transformer located outside of the main electrical room on the northwest corner of the school. Secondary service feeders then run underground in a concrete-encased ductbank from the secondary section of the Pepco utility transformer to the CT cabinet of the main distribution switchboard located in the main electrical room.

The main distribution switchboard in the main electrical room is by Square D, rated at 265/460 volts, 3-phase, 4-wire, with a 1600-ampere bus. The switchboard appears to be original to the building, constructed in 1971. The switchboard has a CT cabinet and a main 1600 ampere circuit breaker and a distribution section. Distribution circuit breakers serve the chiller, motor control center, six panelboards and a step down transformer T2. The switchboard is tapped to serve a disconnect switch that serves the automatic transfer switch.

Generator Power

There is an indoor generator located within the main electrical room, rated at 30-kW, 277/480V, 3-phase, 4-wire, fueled by natural gas. The generator serves a 150-ampere automatic transfer located in the main electrical room. The generator and automatic transfer switches are by Elliot Power Systems Inc and are original to the building. The generator serves the exit and emergency lights and the fire alarm system.

Lighting

Lighting fixtures are generally 2’ x 4’ recessed fluorescent troffers. The fixtures are also air handling types and appear to the original to the building. Metal halide fixtures are used in the gymnasium and the Media Center. The stage has track lights and an auto-transformer dimmer panel.

EXISTING CONDITIONS SURVEY

Data and Voice Wiring System

A Category 5/5E wiring system is installed throughout the school. This system provides connectivity for the computer lab, media center, offices, and classrooms. Each typical classroom has both student and teacher outlets.

Intercom and Sound Systems

The school intercom system has the capability to perform select local calls to classrooms or paging throughout the school. Each classroom has a call switch and ceiling speaker(s). Ceiling speakers are also located throughout the corridors. The main system is a Rauland Telecenter.

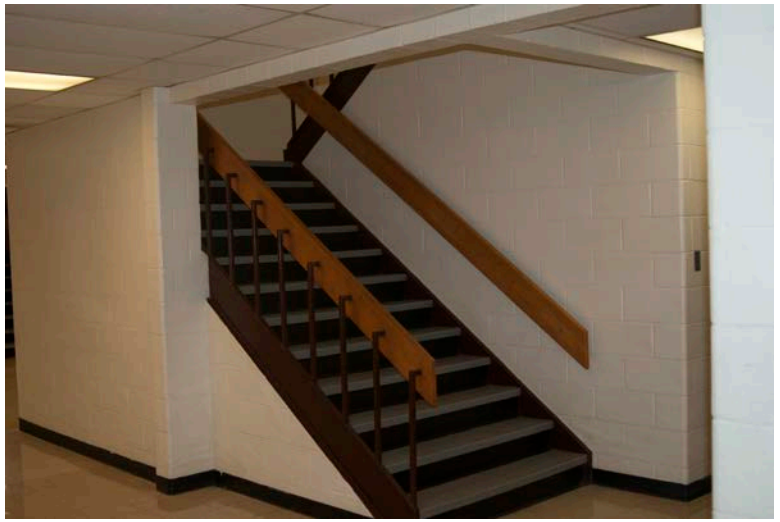
Fire Alarm System

The fire alarm system for the entire school was upgraded during 2011. The fire alarm control panel with voice evacuation is by Fire-Lite Alarms. The fire alarm annunciator panel with graphic display is located in the main lobby. Fire alarm devices include manual pull stations, ceiling-mounted smoke detectors, duct-type smoke detectors, magnetic door holders, monitoring modules for sprinkler flow and valve monitoring tamper switches, and audible and visual notification devices. Fire alarm ceiling-mounted combination speaker/strobes are located in the classrooms. Fire alarm wall-mounted strobes and ceiling-mounted fire alarm speakers are located in the corridors.

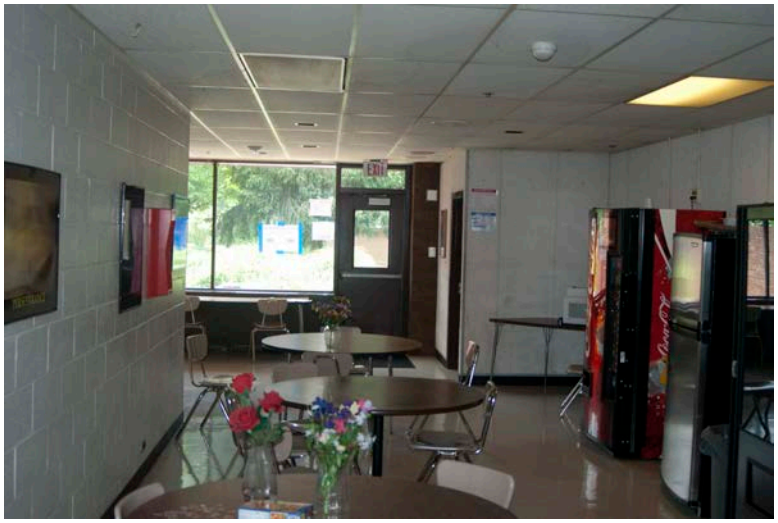
Security System

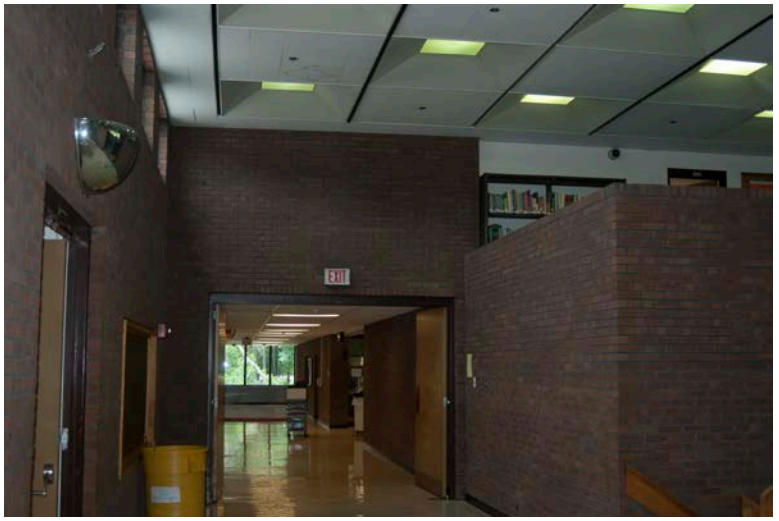
The security system consists of an intrusion detection system with keypads in the main office, and motion sensors in the corridors and classrooms. The security system is by Magnum Alert. There is a door access control card reader and video surveillance camera at the main entrance. Cameras are also located throughout the school.

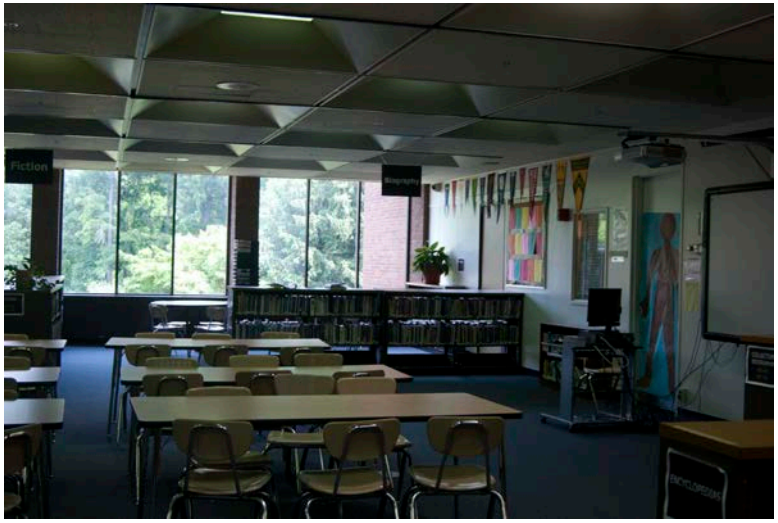
APPENDIX D: PROJECT PHOTOGRAPHS

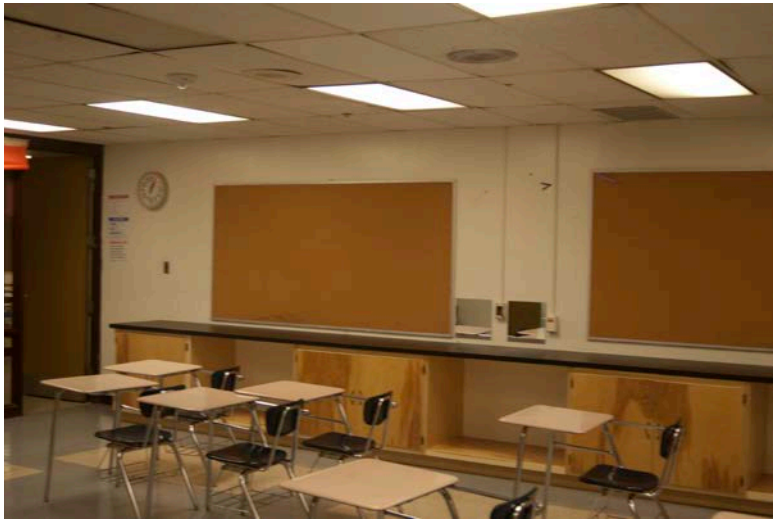


PROJECT PHOTOGRAPHS

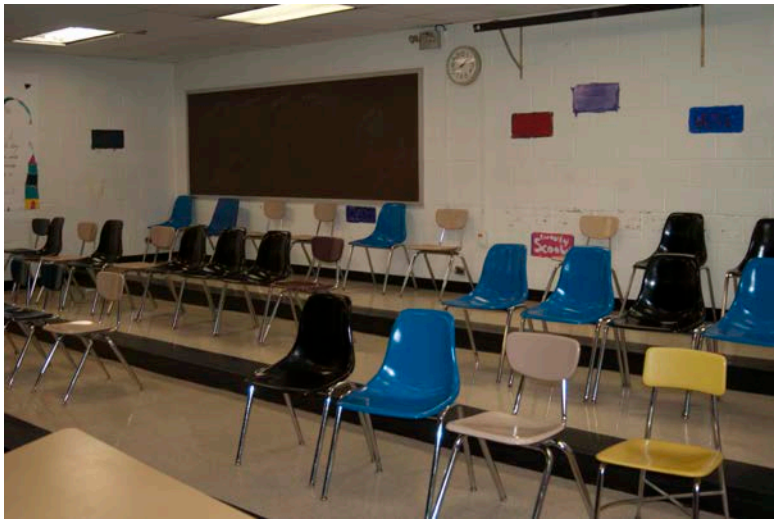








PROJECT PHOTOGRAPHS



PROJECT PHOTOGRAPHS