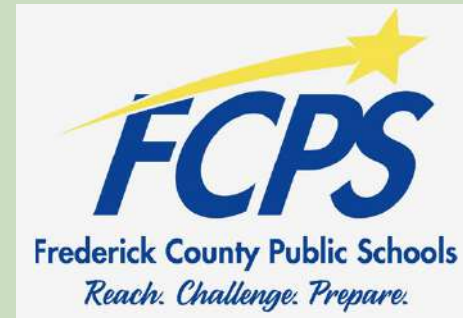


VALLEY ELEMENTARY SCHOOL FEASIBILITY STUDY

Prepared for Frederick County Public Schools

By: Proffitt & Associates Architects

March 24, 2021



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Valley Elementary School

Feasibility Study

3519 Jefferson Pike
Jefferson, Maryland 21755

Prepared for Frederick County Board of Education

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SECTION 1:

EXECUTIVE SUMMARY

- Introduction
- Methodology
- Project Goals
- Existing Conditions Overview
- Summary of Options
- Evaluation Criteria Matrix
- Recommendations

SECTION 1 | EXECUTIVE SUMMARY

INTRODUCTION

This feasibility study for Valley Elementary School was conducted for Frederick County Public Schools (FCPS) by the architectural firm of Proffitt & Associates Architects and their consultants in order to determine the viability of modernizing, expanding, and/or replacing the existing building and performing associated site improvements in order to accommodate an increase in student capacity. Valley Elementary School's projected September 2021 equated enrollment is 477 students from grades pre-kindergarten through 5, and its current state rated capacity is 500 students. The study explores options which would allow the school capacity to increase to 705 students in the base bid or 725 students with the specialized program add alternate and provides specific recommendations to FCPS for implementation.

The intent of the study was to evaluate the physical conditions of the existing building and site and explore options for creation of a facility that meets the educational requirements of its student enrollment and provides a cost effective, energy efficient, and safe facility to meet the future needs of the school. Not only does the existing building need to increase in size, but it also needs to be fully modernized to conform to current educational facility best practices and applicable codes and standards. Options explored include modernization without expansion, modernization with additions, and full replacement. In the modernization without expansion option, all areas of the existing building will remain and will be fully modernized. In the modernization with additions option, portions of the existing building will be demolished, all existing areas to remain will be fully modernized, and new additions will be constructed to provide an increase in capacity. In the replacement option, the existing building will be demolished in its entirety and a new independent facility will be constructed on the same site. In all options, site improvements will be made to improve the flow of traffic, provide additional parking capacity, and improve accessibility on the site. All options explored comply with current specifications for instructional philosophy and current energy, accessibility, and life safety codes. It should be noted that energy codes only require newly installed or modified components to comply with current requirements, so in Options 1 and 2 the existing exterior wall envelope to remain will not be as energy efficient as newly constructed walls in Options 2 and 3. Since it does not add any additional square footage to the building, Option 1 does not provide all of the spaces required for educational programming within the building and would need relocatable classrooms to supplement the building capacity if the school is to serve more than 500 students. Options 2 and 3 both provide a State Rated Capacity of 705 students as required by the educational specifications.

The scope of work included a survey of the physical plant and evaluation of the existing building, including its structural, mechanical, electrical, plumbing, and telecommunications systems. Analysis of the existing building and site was critical to determining the benefits and limitations associated with a modernization or modernization/addition project as compared to a replacement project. The design team reviewed the educational specifications and developed three site and building concepts that are as close as possible to addressing the program criteria, given the individual constraints imposed by the scope of work. Frederick County Public Schools staff reviewed the progression of these concepts throughout the entire process.

The outcome of the study is intended to provide FCPS with information and recommendations that will facilitate the process of deciding the best approach for increasing capacity and modernizing Valley Elementary School. The final concept options, relative construction costs and schedules, and evaluation of the opportunities and challenges for each option are presented in this report.

SECTION 1 | EXECUTIVE SUMMARY

METHODOLOGY

The feasibility study was a collaborative process that involved a multidisciplinary team of FCPS staff from the Capital Program, Maintenance and Operations and Transportation departments, along with consultation of the school administration and custodial staff. Review meetings were held with the FCPS staff team to review project progress and gather input based on the varied expertise of its members. The proposed concept options are a result of the staff members recommendations, suggestions, and guidance during the feasibility study process.

The existing school has been evaluated by the design team of architects and engineers to determine the scope of work required to provide a facility that will comply with the Educational Specification requirements for the current prototype Elementary School. These Educational Specifications were developed by FCPS to provide guidance to the design team regarding the school's needs and facility requirements. They include not only basic space needs in terms of quantities and square footages for individual rooms, but also include discussion regarding designing for optimum learning environments, overall building organization, and systems and equipment requirements. An overview of the Educational Specifications can be found in Section 2 of this document.

The study is based on the following:

- Feedback received via design review meetings held with FCPS staff
- Analysis of the existing physical plant performed via site visits by the design team and FCPS staff
- Review of the building and site existing conditions documents provided by FCPS
- Review of the Educational Specifications provided by FCPS
- Review of the FCPS Design Guide
- Research conducted by the design team

The concept options were refined and revised throughout the process and the final versions are included in this report. It should be noted that the concept options represent viable solutions for addressing the project requirements but are not intended to be final designs. The actual design of the school may vary significantly from the feasibility study concepts and will be determined during the design phase of the project.

SECTION 1 | EXECUTIVE SUMMARY

PROJECT GOALS

Throughout the process, Frederick County Public Schools staff established a set of goals and objectives (delineated below) which the concept options address.

The goals for Valley Elementary School are:

- Develop a range of options that explore both renovation/addition and provision of a replacement school for 705 students per the base bid or 725 students with the Specialized Program Alternate
- Acknowledge phased development of the site with respect to demolition, new construction, access, and use of existing facilities until project is complete
- Address connections to the surrounding community in a way that is open and welcoming yet safe and secure for students
- Meet Public School Construction Program (PSCP) Feasibility Study requirements and support any previous initiatives or long-term planning established by FCPS and the Valley Elementary school community
- Continue to provide a nurturing community school
- Look for opportunities to support 21st Century Learning
- Improve accessibility in the building and on the site
- Provide upgraded technology
- Design an environmentally sensitive school that is comfortable, naturally lit, and energy efficient

SECTION 1 | EXECUTIVE SUMMARY

EXISTING CONDITIONS OVERVIEW

Valley Elementary School is situated on a 31.71-acre property comprised of a single parcel and is located at 3519 Jefferson Pike, Jefferson, Maryland. The original Valley Elementary School building was constructed in 1967. It received additions and renovations in 1973 and underwent a limited scope minor renovation in 2001.

The school serves students in grades pre-kindergarten through 5 and has a state-rated capacity of 500 students. The elementary school's projected September 2021 equated enrollment is 477 students. Increasing enrollment in the Valley Elementary School and neighboring attendance areas are creating a need for additional capacity in this part of the county.

It is a single-story building consisting of approximately 55,783 gross square feet located on terraced finished floor elevations. The main floor level contains approximately 17,773 gross square feet, then ramps down to a central level comprised of 23,045 gross square feet, which in turn ramps to the lowest level containing 14,965 gross square feet.

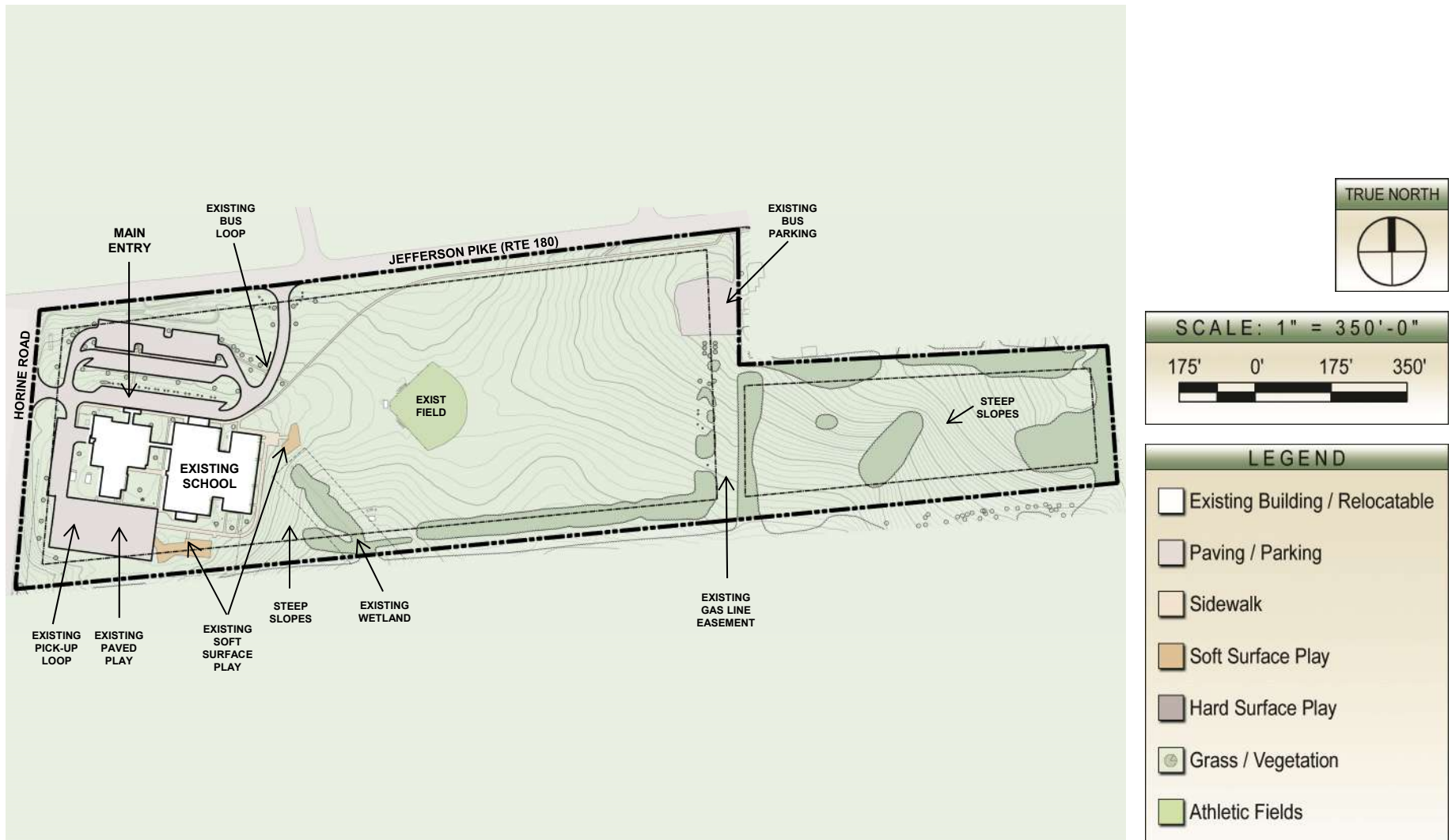
The structure is primarily masonry bearing with an exterior masonry façade. Exterior walls are composed of 8" CMU back-up with 4" face brick veneer. The majority of the veneer is rose face brick with some darker red face brick accents. Accent panels consisting of marble chips adhered to the CMU back-up are used around the classroom wing exterior door/window openings at the original building. Due to its age, the building is not energy efficient and is not fully accessible. There are two transitions in floor elevation that occur between sections of the facility. Ramps are provided at these transitions, however none of them comply with current accessibility requirements. The main entrance faces Jefferson Pike but the building is set back from the road and does not provide a sense of welcome. A new interior security vestibule was added in recent years to provide improved supervision at the main entrance.

The property is bounded to the east by single family homes, to the north by Jefferson Pike (Maryland State Route 180) and single family homes, to the west by Horine Road and single family homes, and to the south by Jefferson National Pike (US-340). Vehicles access the site from a driveway from Horine Road, or a driveway from Jefferson Pike. The school building sits along the western side of the site, with parking to the front and play areas to the back. The site slopes down steeply to the east from the building pad and there is a low point through the center of the site that is designated as a wetland. The eastern portion of the site is sloping field area. At the northeastern corner, there is a gravel driveway and parking area that is utilized for bus parking. There are gas line and telecommunications easements that traverse the site.

There are currently no relocatable classrooms on site, however there are four existing outbuildings. Two are sited between the building and Horine Road and appear to be utilized primarily for storage. One is a shed located adjacent to the baseball field and the last is another shed located near a small outdoor seating area that was once utilized as an environmental education classroom. These outbuildings contain a total of 850 square feet, bringing the total on-site square footage to 56,633.

SECTION 1 | EXECUTIVE SUMMARY

EXISTING CONDITIONS OVERVIEW



EXISTING SITE PLAN

SECTION 1 | EXECUTIVE SUMMARY

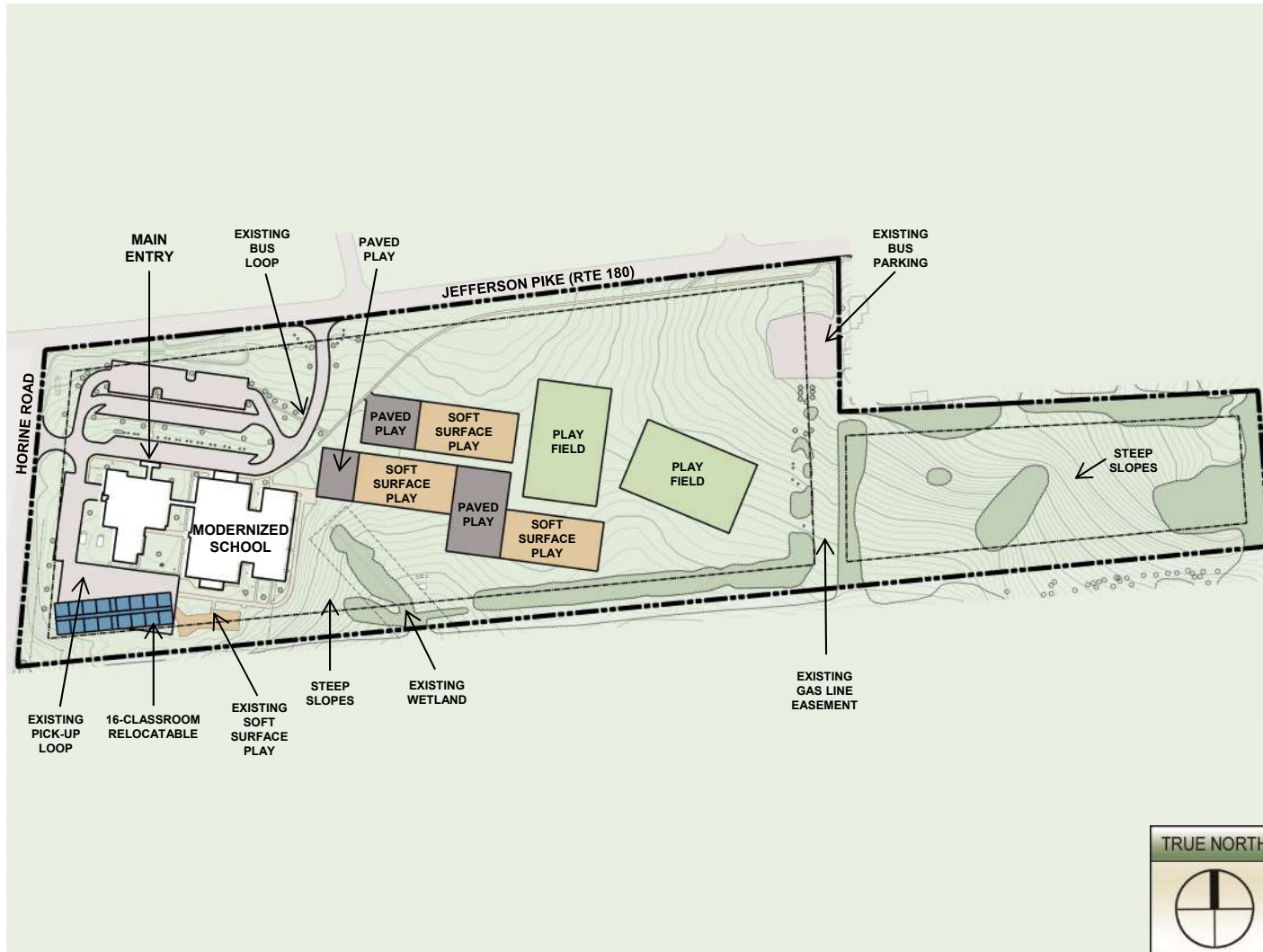
EXISTING CONDITIONS OVERVIEW



EXISTING FLOOR PLAN

SECTION 1 | EXECUTIVE SUMMARY

SUMMARY OF OPTIONS



OPTION 1

Option 1 includes a full modernization of the existing building with no additional space added. It includes a full MEP system replacement, ADA upgrades, all new finishes, casework, and display boards. There is some reconfiguration of space within the building to improve circulation and enclose spaces with permanent walls. Relocatable classrooms will still be required upon completion of construction in order to provide the required capacity. Site components will be expanded and improved to provide additional play area capacity and to address ADA compliance concerns.

OPTION 1 | MODERNIZATION

SECTION 1 | EXECUTIVE SUMMARY

OPTION 1:

AREA OF EXISTING BUILDINGS = 56,633 GSF

AREA OF DEMOLITION = -(177) GSF

AREA OF ADDITIONS = 0 GSF

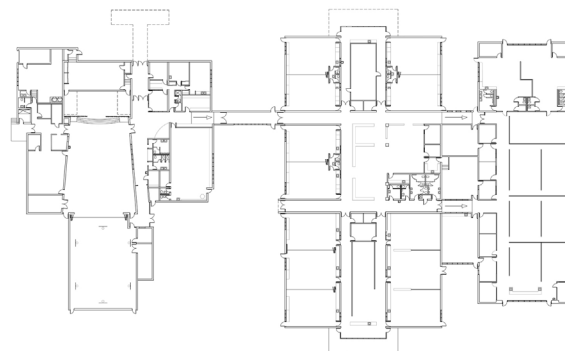
TOTAL MODERNIZED BUILDING = 55,783 GSF*

*673 GSF of outbuildings also remain without modernization but are excluded from total building GSF.

LEGEND

- Demolition
- Addition / New Construction - Base Bid
- Addition / New Construction - Add Alternate
- Existing Building to be Modernized

OPTION 1: DEMOLITION

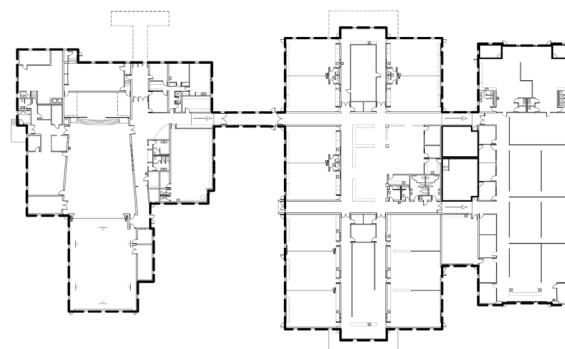


DEMOLITION

MAIN LEVEL = 0 SF

BASEBALL SHED = 177 SF

OPTION 1: MODERNIZATION



MODERNIZATION

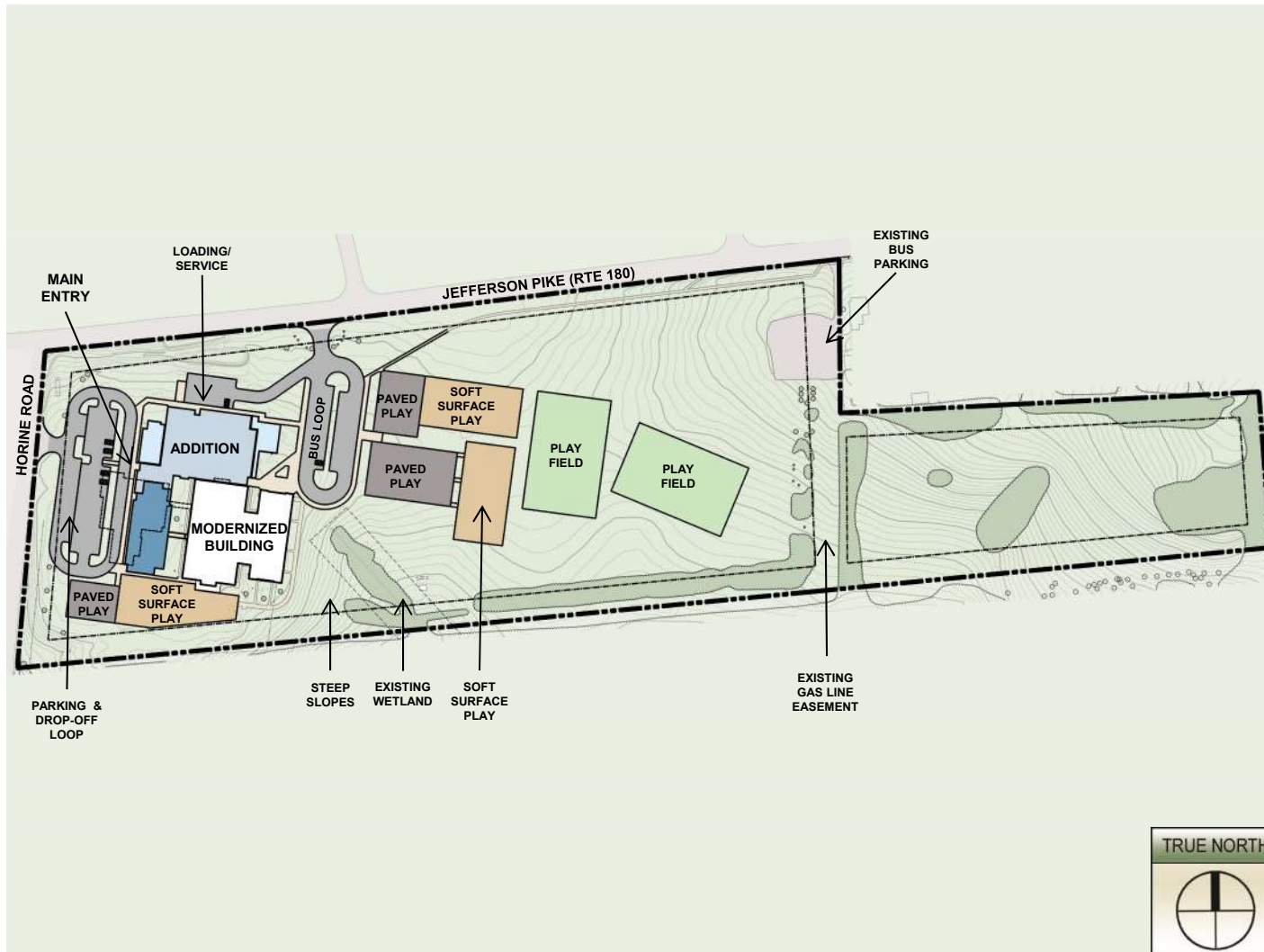
MAIN LEVEL = 55,783 SF

ADDITIONS

MAIN LEVEL = 0 SF

SECTION 1 | EXECUTIVE SUMMARY

SUMMARY OF OPTIONS



OPTION 2

Option 2 includes renovations and additions with limited demolition of the existing building. This option includes demolition of the existing gym, cafetorium, kitchen, and administration wing, a full modernization of the existing facility to remain, and construction of additional space to meet the project requirements. The new main entrance will be located at the west of the addition facing Horine Road. Car rider drop off loop and parking will be accessed from the existing Horine Road entrance. The bus loop, loading, and additional parking will be accessed from Jefferson Pike.

OPTION 2 | MODERNIZATION AND ADDITIONS

SECTION 1 | EXECUTIVE SUMMARY

OPTION 2:

AREA OF EXISTING BUILDINGS = 56,633 GSF

AREA OF DEMOLITION = - (18,943) GSF

AREA OF ADDITIONS – BASE BID = 56,322 GSF

TOTAL NEW BLDG AREA - BASE = 93,856 GSF*

AREA OF ADDITIONS – ADD ALT = 7,414 GSF

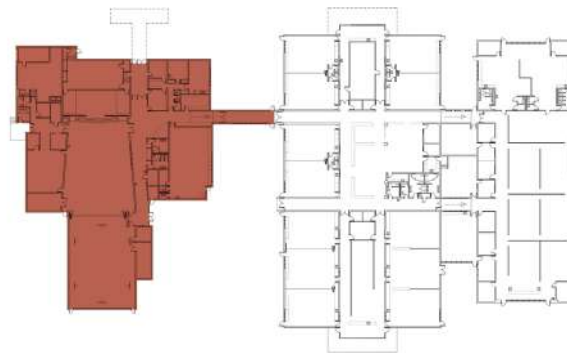
TOTAL NEW BLDG AREA - ALT = 101,270 GSF

*156 GSF Outdoor Learning Shed also remains without modernization but is excluded from total building GSF.

LEGEND

- Demolition
- Addition / New Construction - Base Bid
- Addition / New Construction - Add Alternate
- Existing Building to be Modernized

OPTION 2: DEMOLITION



DEMOLITION

MAIN LEVEL = 18,249 SF

3 OUTBUILDINGS = 694 SF

OPTION 2: MODERNIZATION & ADDITIONS



MODERNIZATION

MAIN LEVEL = 37,534 SF

ADDITIONS – BASE BID

MAIN LEVEL = 42,552 SF

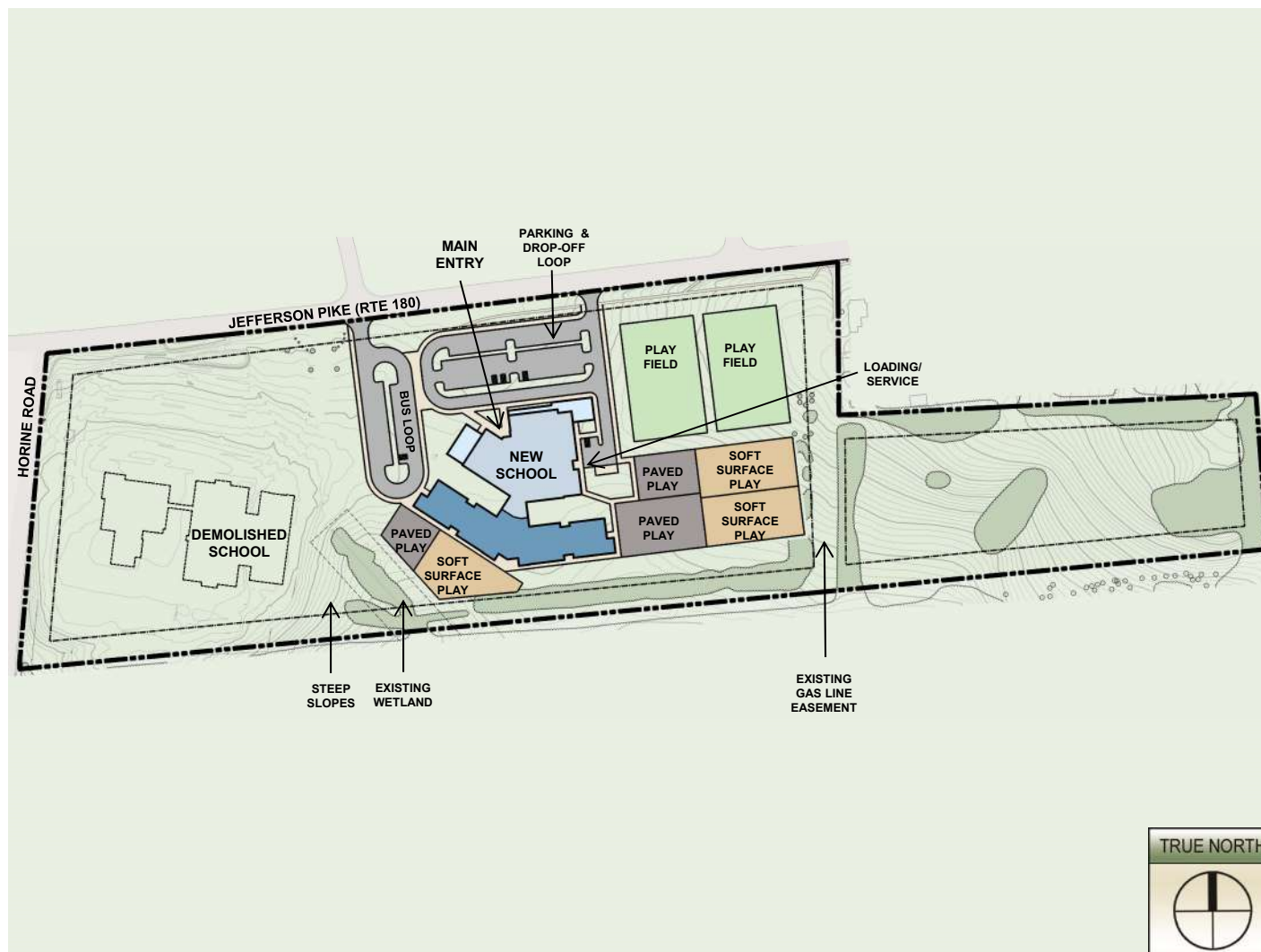
UPPER LEVEL = 13,770 SF

ADDITIONS – ALTERNATE

MAIN LEVEL = 7,414 SF

SECTION 1 | EXECUTIVE SUMMARY

SUMMARY OF OPTIONS



OPTION 3

Option 3 includes a total replacement of the existing building with a new two-story construction. This option includes construction of an entirely new facility on the existing site to meet the project requirements and then demolition of the existing building. The existing building will continue to be operational during the new building construction process. The car rider drop off loop and the main parking area will be accessed from Jefferson Pike to the east of the existing access points. The new bus loop will be accessed from Jefferson Pike, with its access point realigned opposite existing Route 383.

OPTION 3 | REPLACEMENT SCHOOL ON-SITE

SECTION 1 | EXECUTIVE SUMMARY

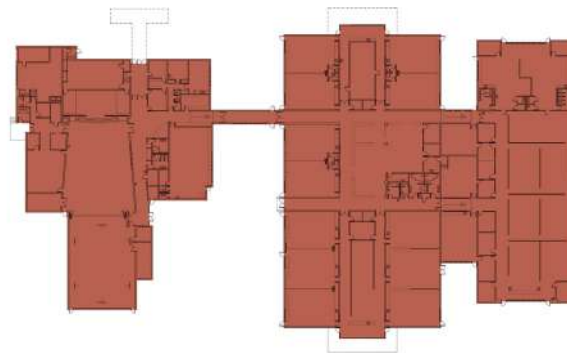
OPTION 3:

AREA OF EXISTING BUILDINGS = 56,633 GSF
 AREA OF DEMOLITION = - (56,633) GSF
 AREA OF NEW CONST. – BASE = 84,210 GSF
AREA OF NEW CONST. – ADD ALT = 7,825 GSF
TOTAL NEW BLDG AREA - ALT = 92,035 GSF

LEGEND

- Demolition
- Addition / New Construction - Base Bid
- Addition / New Construction - Add Alternate
- Existing Building to be Modernized

OPTION 3: DEMOLITION



DEMOLITION

MAIN LEVEL = 55,783 SF
 OUTBUILDINGS = 850 SF

OPTION 3: NEW CONSTRUCTION



MODERNIZATION

MAIN LEVEL = 0 SF

NEW CONSTRUCTION – BASE BID

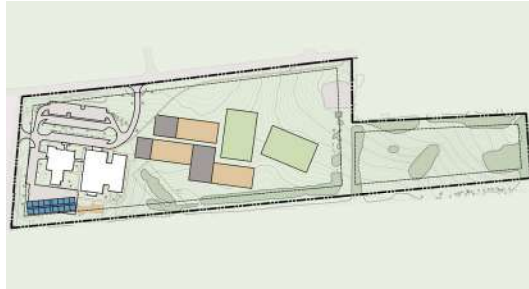
MAIN LEVEL = 56,185 SF
 UPPER LEVEL = 28,025 SF

NEW CONSTRUCTION – ALTERNATE

MAIN LEVEL = 7,825 SF

SECTION 1 | EXECUTIVE SUMMARY

SUMMARY OF OPTIONS | CHALLENGES & OPPORTUNITIES COMPARISON CHART



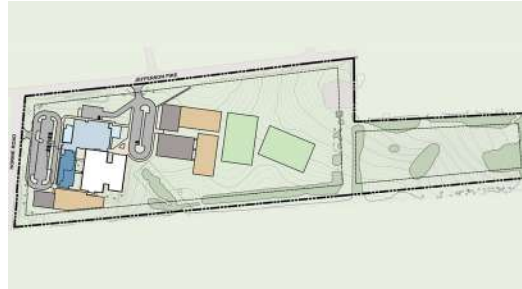
OPTION 1

OPPORTUNITIES

- Minimal disruption to the existing site.

CHALLENGES

- Phasing and temporary facilities will be required.
- 16 portable classrooms will be required after completion to meet capacity of 705.
- Core spaces are significantly undersized.
- Portions of the building are at different finished floor elevations – added cost for renovations required to create an ADA compliant ramp.
- Car stacking space is limited in the drop-off loop due to site constraints.
- The Media Center and many support spaces do not have access to daylight or views to the exterior.
- The Add Alternate spaces cannot be provided within the existing building footprint.
- Limited ceiling space for MEP systems and potential unforeseen envelope conditions will make modernization challenging.
- Construction activities will be disruptive to students and staff.



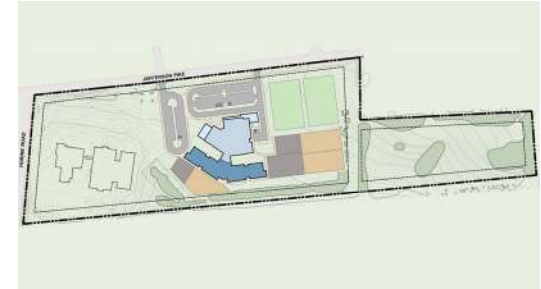
OPTION 2

OPPORTUNITIES

- All Educational Specification requirements can be accommodated while retaining a portion of the existing facility.
- Good separation of buses, cars, and building services/loading.

CHALLENGES

- Phasing and temporary facilities will be required.
- Depending on the final design a courtyard may be desirable to provide daylight and views but could be a maintenance concern.
- The Media Center and many support spaces do not have access to daylight or views to the exterior.
- Portions of the building are at different finished floor elevations – added cost for renovations required to create an ADA compliant ramp.
- Limited ceiling space for MEP systems and potential unforeseen envelope conditions will make modernization challenging.
- Construction activities will be disruptive to students and staff.



OPTION 3

OPPORTUNITIES

- Classroom layouts cluster well for grade level grouping.
- All regularly occupied spaces will have access to daylight and views.
- Temporary facilities are not required during construction.
- Good separation of buses, cars, and building services/loading.

CHALLENGES

- Earthwork and possibly retaining walls will be required to construct the play areas and fields to the east of the new building.
- The existing bus parking area will need to be relocated to another area of the site.

SECTION 1 | EXECUTIVE SUMMARY

SUMMARY TABLE AND COST COMPARISON OF OPTIONS

Square Footage:

	Option 1	Option 2	Option 3
Existing *	56,633	56,633	56,633
New Construction	0	56,322	84,210
Renovation	55,783	37,534	0
Demolition *	177	18,943	56,633
Existing to Remain *	56,456	37,690	0
Total Gross Square Feet	55,783	93,856	84,210
State Rated Capacity	500	705	705
Duration of Construction	24 to 28 months	36 to 38 months	24 to 28 months
Total Construction Cost	\$23,893,747	\$45,583,205	\$43,813,018

The 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 for architectural and construction funding. The square footages and costs above are for the base bid scope of work only. See Section 7 for detailed cost estimates.

* Existing, Demolition, and Existing to Remain lines include outbuilding square footage. This square footage is excluded from the total building gross square foot totals.

SECTION 1 | EXECUTIVE SUMMARY

RECOMMENDATION

After study and discussion of the challenges and opportunities presented by each option, the feasibility study team is recommending Option 3, a replacement facility on the same site, as the best solution to meet the project's educational and functional goals.

The Option 1 modernization does not meet the required capacity requirements in terms of classrooms and support spaces and lacks adequately sized core spaces. The Option 2 renovation/addition option has significant impacts associated with temporary facilities when compared to the replacement facility option and requires phased relocation of classrooms to relocatable classrooms to allow for renovation, which means more impact to students and staff through the construction process. It also requires some compromises to adjacencies due to existing building constraints and has the potential for increased change orders during construction due to unforeseen conditions that may be discovered.

A replacement school meets the educational specifications without compromise, is slightly less costly than the modernization and addition option, has the shortest construction timeline, and minimizes the need for future maintenance of building systems. The replacement option allows flexibility to configure the building and site for optimum adjacencies and efficiency and allows the option of retaining bus parking on site where the current building is located. Replacement also affords the ability to create an energy-efficient building envelope, which will provide long term operating cost savings.



SECTION 2:

SUMMARY OF EDUCATIONAL SPECIFICATIONS

- Educational Program Requirements
- Existing Building and Educational Specifications Program Comparison
- Proposed Organization

SECTION 2 | SUMMARY OF EDUCATIONAL SPECIFICATIONS

EDUCATIONAL PROGRAM REQUIREMENTS

The educational program for the new Valley Elementary building aligns with the requirements set forth by the Frederick County Public Schools' Board of Education approved educational specifications and Standards for the Design of New and Renovated Buildings Design Guide for Pre-K – 5 Elementary Schools. The educational specifications call for a construction project of approximately 84,200 gross square feet that will provide a new elementary school of 31 teaching stations (25 grade 1-5, five kindergarten, and one pre-kindergarten classrooms) as well as supporting spaces to accommodate a state rated capacity of 705 elementary school students in the base bid. Inclusion of the Specialized Program add alternate provides 2 special education classrooms and increases the state rated capacity to 725 students. There is also an add alternate for a Parks and Rec Gym.

General spaces to be provided as part of the new school include:

- (1) Pre-K Classroom
- (5) Kindergarten Classrooms
- (5) General Classrooms for Grade 1
- (5) General Classrooms for Grade 2
- (5) General Classrooms for Grade 3
- (5) General Classrooms for Grade 4
- (5) General Classrooms for Grade 5
- Administration spaces
- Health Suite spaces
- Media Center spaces
- (2) Art Classrooms & storage spaces
- (1) Vocal Music Room & storage space
- (1) Instrumental Music Room & storage space
- STEM Lab
- Support Service Area spaces
- Food Service spaces
- Cafeteria spaces
- Physical Education spaces
- Custodial Operations spaces
- Maintenance spaces

A spreadsheet comparing the spaces currently provided within the existing Valley Elementary building with the program space requirements for a 705 student school is on the following pages. The educational specifications require 84,210 gross square feet of building area per the base bid. The current building and its outbuildings contain approximately 56,633 gross square feet of space, which means that at least an additional 27,577 gross square feet of space is required to meet the program needs. The existing building contains only 22 classrooms, while a total of 31 classrooms are required. Except for 6 rooms, the existing typical classrooms contain at least 800 square feet apiece, which meets the educational specification requirements. There are currently 4 classrooms that are large enough to meet the requirements for kindergarten use, however they are not all located within proximity of one another for grade level clustering. All the classrooms in the 1967 wing have adequate square footage and can be re-used in renovation/addition scenarios. Once modernized, they will provide a functional learning environment. In the 1973 wing, the classrooms are enclosed by demountable partitions and new permanent walls will be provided to create classrooms that comply with current size requirements. The core spaces are all undersized and in general support spaces are lacking in terms of quantity, size, and location.

SECTION 2 | SUMMARY OF EDUCATIONAL SPECIFICATIONS

EXISTING BUILDING AND EDUCATIONAL SPECIFICATIONS PROGRAM COMPARISON

	VES SF is greater			Ed Spec SF is greater			
	EXISTING VALLEY BUILDING			705 STUDENT EDUCATIONAL SPECIFICATIONS (BASE BID)			
SPACE	QUANTITY	NET SQUARE FEET PER ROOM	NET SQUARE FEET PER FUNCTION	QUANTITY	NET SQUARE FEET PER ROOM	NET SQUARE FEET PER FUNCTION	DIFFERENCE (NSF)
Administration							
Secretarial/Reception Waiting Area	1	187	187	1	450	450	-263
Workroom	1	86	86	1	200	200	-114
Principal's Office	1	147	147	1	150	150	-3
Asst. Principal's Office*	1	204	204	1	120	120	84
Conference Room*	1	296	296	1	200	200	96
Administration Bathroom	0	0	0	1	50	50	-50
Student Bathroom	0	0	0	1	300	300	-300
Teacher's Lounge with Bathroom**	1	329	329	1	400	400	-71
General Office Storage	1	214	214	0	0	0	214
Staff Bathrooms @ 50SF (to be distributed throughout school)	2	0	136	4	50	200	-64
Men	1	53	53				
Women	1	83	83				
Total Administration			1,599			2,070	-471
Health Suite							
Nurse's Office	0	0	0	1	100	100	-100
Health Suite Waiting Area	1	195	195	1	80	80	115
Health Tech Area	0	0	0	1	120	120	-120
Rest Area	0	0	0	1	120	120	-120
Health Room w/ small shower and toilet	1	32	32	1	60	60	-28
Storage	0	0	0	1	40	40	-40
Total Health Suite			227			520	-293
Media Center							
Media Office and Equipment Storage/workroom	2	0	184	1	300	300	-116
Media Office	1	91	91				
Media Storage	1	93	93				
Open Resource Area (w/ informal reading area)	1	2,147	2,147	1	2,000	2,000	147
Small Group Instruction Area	1	121	121	1	400	400	-279
Media Broadcast Room	0	0	0	1	180	180	-180
STEM Lab	0	840	0	1	800	800	-800
Computer, TV, Communications Main Distribution Frame	1	148	148	1	300	300	-152
Remote Telecommunications Equipment Closets	0	0	0	2	100	200	-200
Total Media Center			3,520			4,180	-660
Art							
Art Studio A	1	1,415	1,415	1	980	980	435
Storage for Studio A	1	74	74	1	150	150	-76
Art Studio B	1	691	691	1	980	980	-289
Storage for Studio B	1	205	205	1	150	150	55
Total Art			2,385			2,260	125

SECTION 2 | SUMMARY OF EDUCATIONAL SPECIFICATIONS

EXISTING BUILDING AND EDUCATIONAL SPECIFICATIONS PROGRAM COMPARISON

	VES SF is greater			Ed Spec SF is greater			
	EXISTING VALLEY BUILDING			705 STUDENT EDUCATIONAL SPECIFICATIONS (BASE BID)			
SPACE	QUANTITY	NET SQUARE FEET PER ROOM	NET SQUARE FEET PER FUNCTION	QUANTITY	NET SQUARE FEET PER ROOM	NET SQUARE FEET PER FUNCTION	DIFFERENCE (NSF)
Music							
Vocal Music Room	1	882	882	1	800	800	82
Music Storage Room	2	0	51	2	75	150	-99
Storage Room 1	1	31	31				
Storage Room 2	1	20	20				
Instrumental Music Room	0	0	0	1	800	800	-800
Total Music			933			1,750	-817
Physical Education							
Gymnasium, full basketball court size	1	2,883	2,883	1	5,900	5,900	-3017
Indoor/Outdoor equipment storage	1	248	248	1	350	350	-102
Outdoor Storage	1	60	60	0	0	0	60
Bathrooms Area - Boys and Girls	2	112	224	1	320	320	-96
Teacher office/bathroom/shower/dressing	1	100	100	1	200	200	-100
Total Gymnasium			3,515			6,770	-3255
Pre-Kindergarten							
Pre-Kindergarten Classrooms	1	897	897	1	980	980	-83
Pre-Kindergarten Bathrooms***	0	0	0	1	60	60	-60
Pre-Kindergarten Storage Room	0	0	0	1	175	175	-175
Total Pre-Kindergarten			897			1,215	-318
Kindergarten							
Kindergarten Classrooms	3	3,156	3,156	5	980	4,900	-1744
Kindergarten	1	897	897				
Kindergarten	1	1,187	1,187				
Kindergarten	1	1,072	1,072				
Kindergarten Bathrooms	3	0	123	5	50	250	-127
Single Use	2	24	48				
Combination	1	75	75				
Indoor/Outdoor Storage Rooms	2	143	286	2	200	400	-114
Total Kindergarten			3,565			5,550	-1985

SECTION 2 | SUMMARY OF EDUCATIONAL SPECIFICATIONS

EXISTING BUILDING AND EDUCATIONAL SPECIFICATIONS PROGRAM COMPARISON

	VES SF is greater			Ed Spec SF is greater			
	EXISTING VALLEY BUILDING			705 STUDENT EDUCATIONAL SPECIFICATIONS (BASE BID)			
SPACE	QUANTITY	NET SQUARE FEET PER ROOM	NET SQUARE FEET PER FUNCTION	QUANTITY	NET SQUARE FEET PER ROOM	NET SQUARE FEET PER FUNCTION	DIFFERENCE (NSF)
Learning Area, Grades 1-5							
General Classrooms	18	15,508	15,508	25	800	20,000	-4492
First Grade	1	894	894	1	800	800	94
First Grade	1	894	894	1	800	800	94
First Grade	1	887	887	1	800	800	87
First Grade	1	889	889	1	800	800	89
Second Grade	1	929	929	1	800	800	129
Second Grade	1	1,017	1,017	1	800	800	217
Second Grade	1	933	933	1	800	800	133
Third Grade	1	931	931	1	800	800	131
Third Grade	1	929	929	1	800	800	129
Third Grade	1	1,009	1,009	1	800	800	209
Third Grade	1	928	928	1	800	800	128
Fourth Grade	1	695	695	1	800	800	-105
Fourth Grade	1	782	782	1	800	800	-18
Fourth Grade	1	824	824	1	800	800	24
Fourth Grade	1	991	991	1	800	800	191
Fifth Grade	1	732	732	1	800	800	-68
Fifth Grade	1	638	638	1	800	800	-162
Fifth Grade	1	606	606	1	800	800	-194
General Classroom Group Bathrooms	4	0	767	3	300	900	-133
	2	77	154				
	1	321	321				
	1	292	292				
General Classroom Storage	3	0	494	0	0	0	494
Storage 1	1	163	163				
Storage 2	1	149	149				
Storage 3	1	182	182				
Planning Rooms	0	0	0	2	300	600	-600
Total Learning area, Grades 1-5			16,769			21,500	-4731

SECTION 2 | SUMMARY OF EDUCATIONAL SPECIFICATIONS

EXISTING BUILDING AND EDUCATIONAL SPECIFICATIONS PROGRAM COMPARISON

	VES SF is greater			Ed Spec SF is greater			
	EXISTING VALLEY BUILDING			705 STUDENT EDUCATIONAL SPECIFICATIONS (BASE BID)			
SPACE	QUANTITY	NET SQUARE FEET PER ROOM	NET SQUARE FEET PER FUNCTION	QUANTITY	NET SQUARE FEET PER ROOM	NET SQUARE FEET PER FUNCTION	DIFFERENCE (NSF)
Supporting Services Area							
Offices with desks for math and reading Interventionists and specialists, special education	1	161	161	2	800	1,600	-1439
Intervention/Collaboration Rooms (to be used for reading, math, EL, pull-out special education)	1	894	894	4	200	800	94
Calming Room	0	0	0	2	200	400	-400
Guidance	1	206	206	2	200	400	-194
Itinerant Staff (Psychologist/Social Worker/Behavior	0	0	0	1	200	200	-200
Speech/Language and Itinerant Services, OT/PT	1	166	166	1	360	360	-194
EL Level 1 classrooms	0	0	0	1	800	800	-800
Community Liaison Office/Storage	0	0	0	1	200	200	-200
Parent Work Room	0	0	0	1	200	200	-200
Reading Specialist/Book Rooms	1	522	522	1	400	400	122
Reading Basals	1	56	56	0	0	0	56
Total Supporting Services			2,005			5,360	-3355
Food Service							
Kitchen - Serving/Food prep/Transport	1	762	762	1	1,400	1,400	-638
Dry Food Storage	1	90	90	1	150	150	-60
Non-food storage	0	0	0	1	60	60	-60
Refrigerated storage – walk-in	0	0	0	1	130	130	-130
Frozen Food storage – walk-in	1	96	96	1	120	120	-24
Office	1	94	94	1	80	80	14
Locker/restroom/washer & dryer area	1	61	61	1	120	120	-59
Dishwashing area	1	114	114	1	220	220	-106
Can Wash/Storage	1	75	75	0	0	0	75
Inside receiving area	0	0	0	1	60	60	-60
Covered outside unloading area	0	0	0	1	0	0	0
Total Food Service			1,292			2,340	-1048
Cafetorium							
Dining area	1	3,003	3,003	1	3,500	3,500	-497
Stage	1	831	831	1	850	850	-19
Chair Storage	0	0	0	1	300	300	-300
Table Storage	1	283	283	1	200	200	83
Custodial Room	1	83	83	1	60	60	23
Total Cafetorium			4,200			4,910	-710

SECTION 2 | SUMMARY OF EDUCATIONAL SPECIFICATIONS

EXISTING BUILDING AND EDUCATIONAL SPECIFICATIONS PROGRAM COMPARISON

	VES SF is greater			Ed Spec SF is greater			
	EXISTING VALLEY BUILDING			705 STUDENT EDUCATIONAL SPECIFICATIONS (BASE BID)			
SPACE	QUANTITY	NET SQUARE FEET PER ROOM	NET SQUARE FEET PER FUNCTION	QUANTITY	NET SQUARE FEET PER ROOM	NET SQUARE FEET PER FUNCTION	DIFFERENCE (NSF)
Custodial Operations							
Custodial Office	0	0	0	1	175	175	-175
Locker room/shower/bathroom, women	0	0	0	1	90	90	-90
Locker room/shower/bathroom, men	1	30	30	1	90	90	-60
Central Indoor Storage	1	219	219	1	300	300	-81
Indoor Satellite Storage @ 50 sq. ft.	0	0	0	4	50	200	-200
Outdoor storage	2	240	480	1	350	350	130
Total Custodial Operations			729			1,205	-476
Maintenance							
Maintenance Office	0	0	0	1	120	120	-120
Maintenance storage area	0	0	0	1	400	400	-400
Total Maintenance			0			520	-520
TOTAL BASE BID NET SQUARE FEET			41,636			60,150	-18,514
TOTAL BASE BID GROSS SF @ 1.4 net to gross ratio			55,783			84,210	-28,427
Outdoor Storage Shed 1 GSF			253				
Outdoor Storage Shed 2 GSF			264				
Baseball Field Shed GSF			177				
Outdoor Learning Shed GSF			156				
TOTAL GROSS SF (including Outbuildings)			56,633				

Add Alternates

Parks & Rec Dept Gym (Add-Alternative)							
Spectator space in the gym	0	0	0	1	969	969	
Recreation Center activities room	0	0	0	1	1,400	1,400	
Recreation Center office/storage	0	0	0	1	400	400	
Recreation Center Bathrooms w/ exterior access	0	0	0	1	300	300	
Total Add - Alternative Parks & Rec Dept Gym			0			3,069	
Specialized Program (Add-Alternative)							
Classrooms	0	0	0	2	800	1,600	
Specialized Program Coordinator Office	0	0	0	1	200	200	
Restraint/Seclusion Rooms	0	0	0	1	120	120	
Sensory Room	0	0	0	1	600	600	
Total Add - Alternative Specialized Program			0			2,520	
TOTAL NET SQUARE FEET with ADD ALTERNATES			0			65,739	
TOTAL GROSS SQUARE FEET with ADD ALTERNATES						92,035	

* AP Office and Conference Room are not within Admin. Suite.

** Teacher's Lounge does not have an associated Bathroom.

*** Pre-K and adjacent K Classroom share a Toilet - Toilet is counted in Kindergarten Count.

SECTION 2 | SUMMARY OF EDUCATIONAL SPECIFICATIONS

PROPOSED ORGANIZATION

The proposed new school building, whether it be a replacement option or renovation/addition option, should generally be organized to provide two distinct areas: public and private zones. Design options typically provide two distinct entrances, one main entrance that is used by students, staff, and visitors and can be secured as the only means of access to the building during the school day, and a secondary entrance that is intended for public after-hours use but can also be used by staff and students as required during the school day. Public areas of the school such as the gymnasium and cafeteria should be located and configured so that public and community members would have access with nearby parking and the ability to secure those areas independently from the remainder of the building. More private spaces, such as the media center, classrooms, and student-centered space programs should be located so a distinct separation could be provided which would allow for a separate and safe environment for the students. The options provided follow these general principles, although the renovation/addition schemes sometimes must compromise in terms of optimal adjacencies due to existing building constraints.

Some of the organizational concepts preferred include:

- A school environment that allows students to work together in small and large group activities.
- Access to technology.
- Administrative services organized to facilitate the teaching and learning process.
- Centrally located media center convenient to instructional areas.
- Physical education spaces that can support a variety of student needs and community uses.
- A cafeteria space that can be maximized in use for a variety of functions such as assemblies and special programs.
- Interior circulation that promotes a smooth and safe flow of students.
- Abundance of natural light in classrooms and occupied spaces; orientation of exterior windows to capture the most appropriate natural light.
- A school as a community center fixture so that the building may be used by the public.
- A sustainably-designed school that takes advantage of the site to provide outdoor learning areas and gathering areas around the building.
- Outdoor areas may also be used by the community.
- Security and safety should be provided throughout, balanced with the ability to allow accessibility to the building and outdoor spaces in a welcoming environment.
- Making the building “future ready” – to allow flexibility in future modernization of the school.



SECTION 3:

EXISTING INVENTORY DATA

- Current Use and Enrollment
- Previous State and Local-Funded Projects
- Site Aerial Photo
- Existing Building Construction Dates and Types

SECTION 3 – EXISTING INVENTORY DATA

CURRENT USE AND ENROLLMENT

Valley Elementary School serves students in grades pre-kindergarten through 5 and has a state-rated capacity of 500 students. The elementary school's projected September 2021 equated enrollment is 477 students.

It is a single-story building consisting of approximately 55,783 gross square feet located on terraced finished floor elevations. The main floor level contains approximately 17,773 gross square feet, then ramps down to a central level comprised of 23,045 gross square feet, which in turn ramps to the lowest level containing 14,965 gross square feet. There are four small shed-type outbuildings on site used primarily for storage.

There are currently no relocatable classroom buildings on site.

Photo at right is the main site access point from Jefferson Pike.



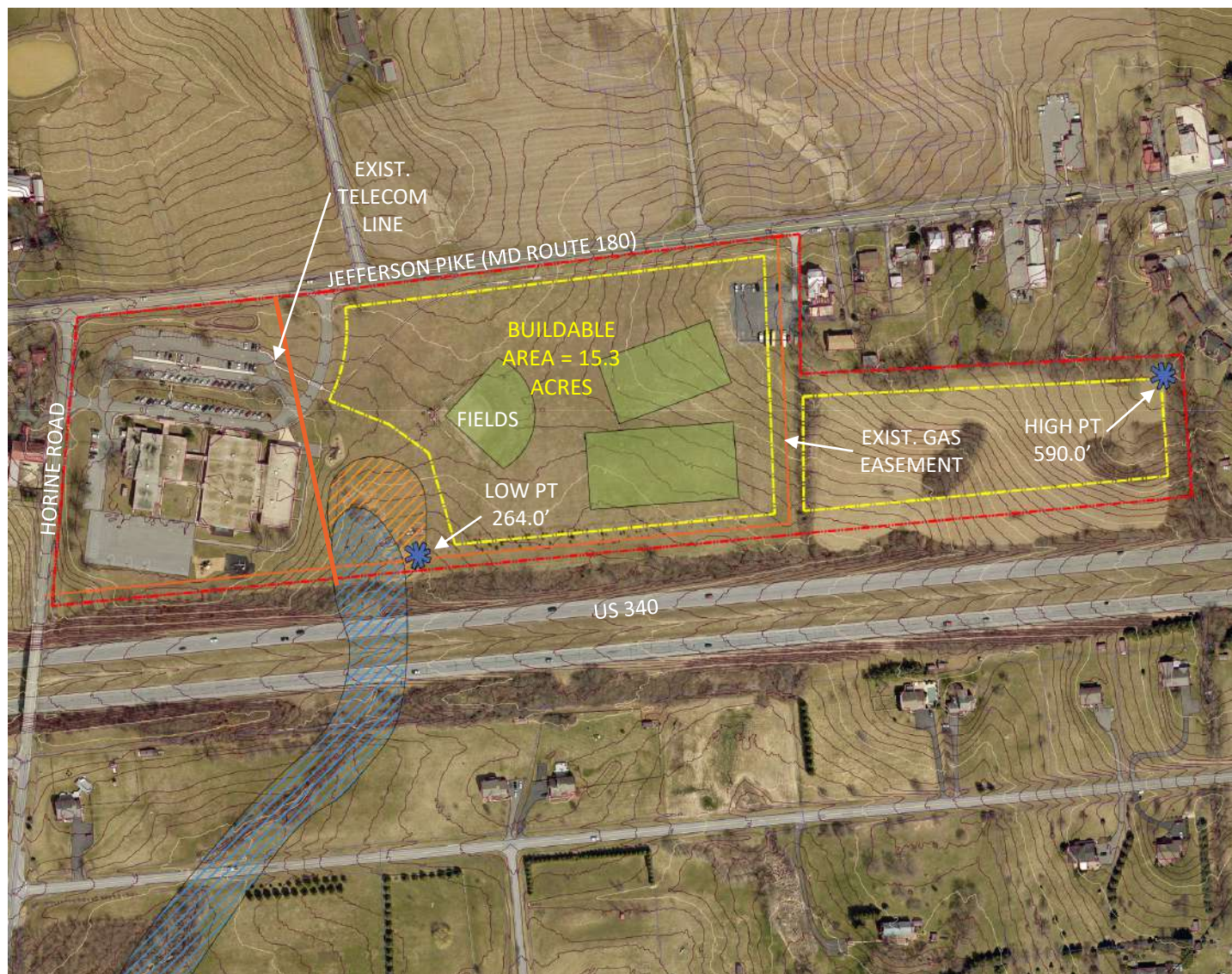
PREVIOUS STATE AND LOCAL-FUNDED PROJECTS

Project	Year	State	Local
Addition/Renovation	1973		
Roof Replacement	1990		X
Roof Replacement	1994		X
Carpet Replacement	1996		X
Oil Tank Replacement	1999		X
Tech In MD Schools	2000	X	X
Addition/Renovation	2001		X
Playground Upgrade	2002		X
Parking Lot	2002		X
Chiller	2004	X	X
Lighting Retrofit	2014		X
Security Initiative – Vestibule	2014	X	X
Security Initiative – Alertus	2014		X
Boiler Replacement	2015	X	X
Roof Replacement	2016	X	X
Fire Alarm Replacement (ASP)	2018	X	X
Roof Replacement	2018		X
Playground	2019		X



View of site sign along Jefferson Pike frontage

SECTION 3 – EXISTING INVENTORY DATA



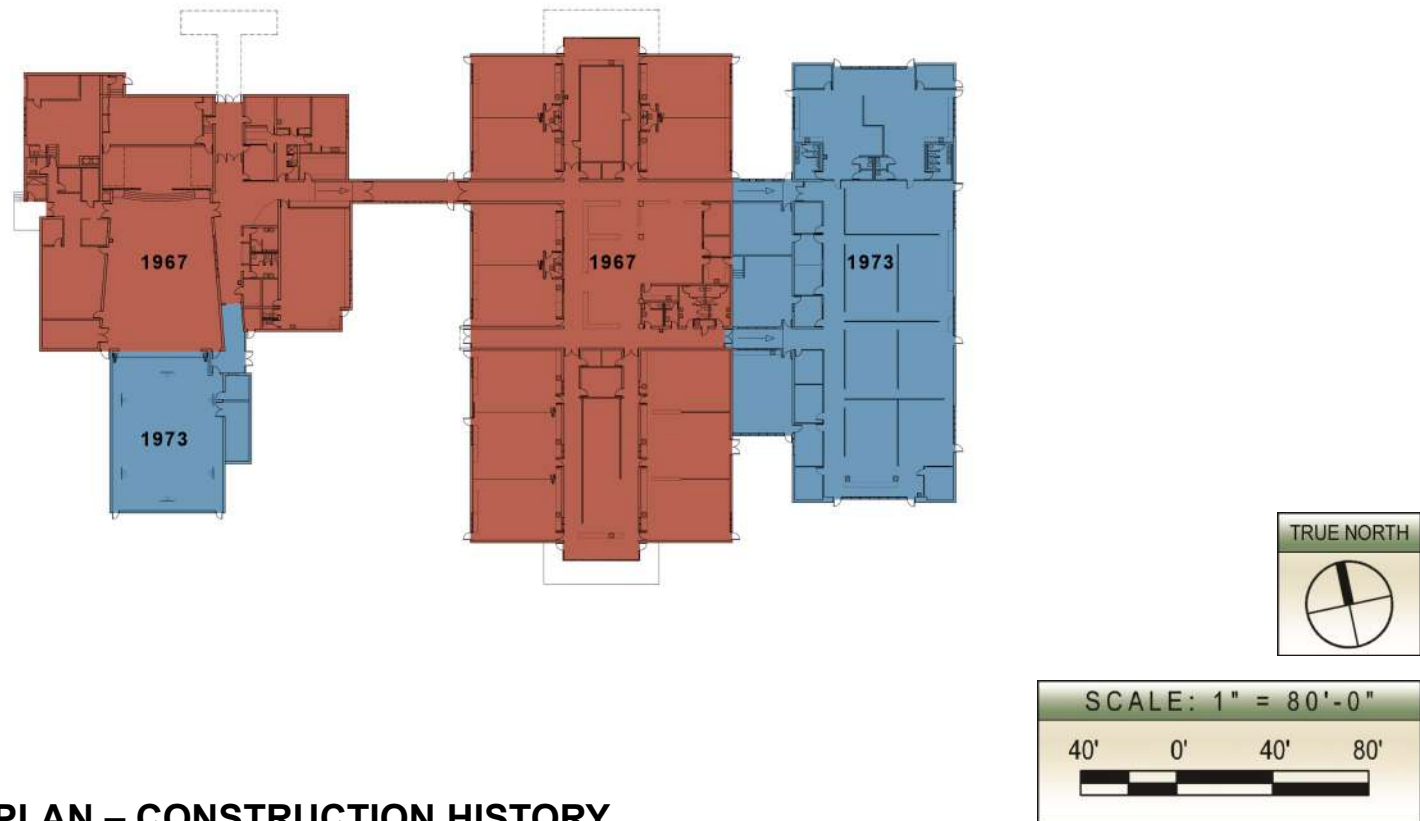
LEGEND	
	Property Line
	Buildable Area
	Utilities (Public)
	Athletic Fields
	Flood Plain
	Hydric (Flood) Soils
	Potential Wetlands
	Forestation Easements



**VALLEY
ELEMENTARY
SCHOOL**

SECTION 3 – EXISTING INVENTORY DATA

The original Valley Elementary School building was constructed in 1967. It received additions and renovations in 1973 and underwent a limited scope minor interior renovation in 2001. The diagram below indicates when each portion of the building was constructed.



EXISTING FLOOR PLAN – CONSTRUCTION HISTORY



SECTION 4:

EXISTING CONDITIONS ASSESSMENT

- Introduction
- General Site Information
- Site Analysis
- Architectural Analysis
- Building Code Analysis
- Food Service Analysis
- Structural Analysis
- Mechanical and Plumbing Analysis
- Electrical and Telecommunications Analysis

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

INTRODUCTION

Valley Elementary School was originally constructed in 1967. Two single-story additions which contained classrooms, support spaces, and the gymnasium were constructed in 1973.

The school currently has a state-rated capacity of 500 students. It is a single-story building consisting of approximately 55,783 gross square feet. An existing conditions walk-through was conducted with the feasibility study team and members of FCPS staff to review and discuss the visible existing building features and systems.

GENERAL SITE INFORMATION

Valley Elementary School is situated on a 31.71-acre property comprised of a single parcel and is located at 3519 Jefferson Pike, Jefferson, Maryland. The school property is zoned IST (Institutional), and thus has no setback or height restrictions, other than the property should be in general conformance with the size and scale of the surrounding zone(s). In this case, the property is bounded by the R3 (Low Density Residential) Zone. Uses

within the R3 District are subject to the following dimensional standards: 30' maximum height; 40' front yard setback; 50' rear yard setback; and 50' side yard setback; the proposed site improvements should be in general conformance with these standards. A school is allowed by right within the IST Zone. The property is bounded to the east by single family homes, to the north by Jefferson Pike (Maryland State Route 180) and single family homes, to the west by Horine Road and single family homes, and to the south by Jefferson National Pike (US-340).



Valley ES – Aerial Photo (Courtesy of Frederick County GIS)

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

SITE ANALYSIS

ADJOINING STREETS

Valley Elementary School is accessed via Jefferson Pike (Maryland State Route 180) and Horine Road; which are both two-lane roads. There is curb and gutter at the main entrance to the school at Horine Road, but nowhere else in the vicinity of the site. However, Jefferson Pike is partially improved with curb and gutter from the driveway to the east. The site also abuts Jefferson National Pike (US-340), but there is not a driveway connection, nor the ability to connect to this road.

SITE PARKING AND CIRCULATION

On-Site Pedestrian and Vehicular Access

Vehicles access the site from a driveway from Horine Road, or a driveway from Jefferson Pike. Sight distance at Jefferson Pike appears adequate. However, sight distance for cars exiting during arrival/dismissal along Horine Road may be an issue. There is a sidewalk from Jefferson Pike that connects to the school. The sidewalk is compliant with ADA; however, there is a connection to a crosswalk at Puller Drive near the east end of the site that is not compliant. This newly constructed sidewalk is sloped at 6.7% and does not have handrails as required for slopes in excess of 5%.



View of bus loop entrance/exit to Jefferson Pike



View to south along Horine Road with slight crown

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

SITE ANALYSIS (Continued)

SITE PARKING AND CIRCULATION (Continued)

Bus Loop

There is a defined bus loop at the site, where buses are connected to the driveway along Jefferson Pike. Bus riders arrive and are dismissed from the front entry of the building.

Car Rider Drop-off / Pick-up Loop

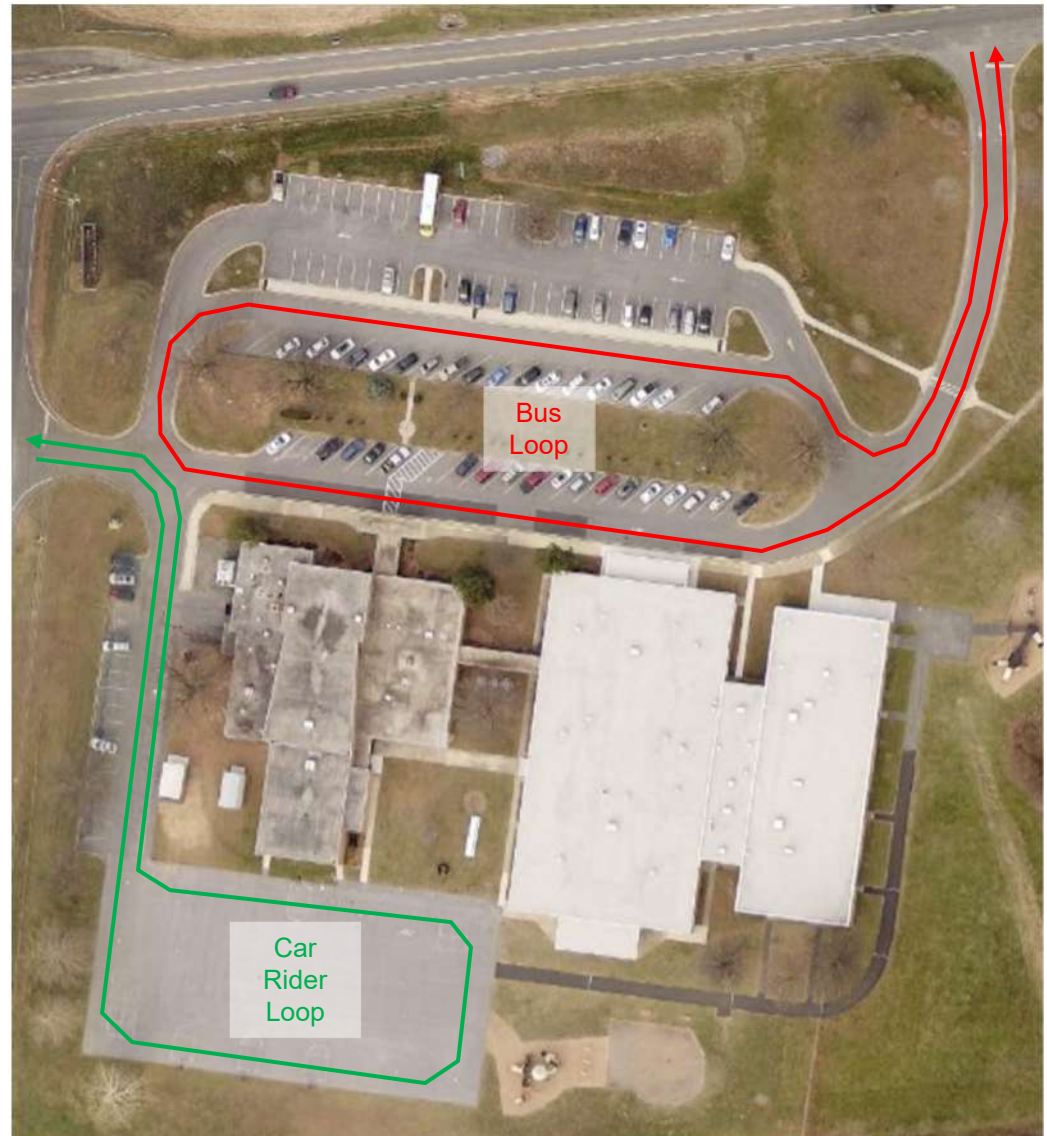
Car riders are dropped off and picked up in the driveway on the west side of the building. The cars are routed through the paved play area at the rear of the building and stage along a driveway. Students are routed to/from the cafeteria. The car drop-off appears to be functioning to separate this activity from buses.

On-site Loading

The loading area is located along the west side of the building and accessed via the driveway from Horine Road. There appears to be adequate space for box trucks to utilize this area provided that these areas are not blocked by cars parked in non-marked spaces. Semi-trucks would need to utilize the main entry to the building as there is not adequate space at the loading area.

Fire Access

The existing site layout appears to meet current requirements for fire access. There are no fire hydrants on site and water for fire suppression would be brought in by a tanker in the event of a fire at the site or serviced from existing hydrants along Jefferson Pike.



Bus and car loops

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

SITE ANALYSIS (Continued)

SITE PARKING AND CIRCULATION (Continued)

On-site Parking

Currently, on-site parking is provided in two (2) parking areas, the largest of which is north of the building, and the smaller is on the west side of the building. The north area is directly in front of the building and provides 99 spaces (2 are ADA compliant). The west parking area provides 18 spaces, of which none are designated ADA accessible spaces. The total on-site parking capacity of 117 spaces exceeds the zoning requirement, which is 58 spaces (two spaces are required per classroom).

The current number of accessible spaces does not meet the minimum number per current ADA regulations; furthermore, current ADA requirements are based on each lot and not the site as a whole. Additionally, the signage and slope (in excess of 5%, maximum allowable is 2%) of these spaces do not meet current ADA regulations. During the design phase accessible spaces should be added to every parking area per ADA regulations. Overall, the drive aisles and parking areas appear to be in fair condition. Other paved areas of the site are utilized for parking, but these areas do not appear to be defined parking spaces.



North parking/bus loop



West parking, drop-off access, and loading access

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

SITE ANALYSIS (Continued)

TOPOGRAPHY AND VEGETATION

Site Topography and Drainage

The site can be best described as rolling. There are various areas of the site that are flat, but there is a steep grade down from the school to the wetlands and US-340. Similarly, the parking lot on the north side of the school sits higher than the grade along Jefferson Pike. The property also includes land on the far eastern side of the site. This area is separated from the school fields by a wooded area. It does not appear that this area is utilized by the school. Moreover, this area has slope to it that may make it cost preventative to completely use.

The areas around the building are relatively flat. It appears that attempts have been made over the years to correct the ponding water around the building, but they don't seem to have been effective. In particular there are many small yard drains that are set higher than the grade around them. Similarly, there is a downspout emptying into an area adjacent to the loading dock that does not seem to drain. Adjacent to a classroom the grade is almost level with the louver and may be allowing water into the building through this route.

Outfalls from the school site appear to be stabilized. The channel along US-340 appears to be free and clear of any debris that would impede flow and create issues on the school site.



Rolling topography along Jefferson Pike



Yard inlet drainage issues



US-340 westbound drainage channel

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

SITE ANALYSIS (Continued)

TOPOGRAPHY AND VEGETATION (Continued)

Stormwater Management

There is an existing stormwater management facility that seems to be utilized as a learning opportunity on the east side of the building. In conversations with the Owner, we understand that this is currently not being used, but provides some function for stormwater management.

In addition, there is an existing surface stormwater management facility in the northwest corner of the property. This facility seems to have been designed to take drainage from the northern parking lot. However, the inflow to the facility seems to have been breeched and water is bypassing the stormwater facility and flowing out into Jefferson Pike. The inflow to this facility on the east side is full of sediment and has deteriorated the pavement and needs to be maintained before additional failures are seen.

Any new construction that occurs will be required to meet the requirements established by the Stormwater Act of 2007. These guidelines establish a process by which new construction needs to utilize sustainable or environmental site design (ESD) to the maximum extent possible to satisfy water quality requirements. ESD's include but are not limited to micro-bioretenion, dry and/or wet swales, rain gardens, etc. Attempts should be made to provide for impervious disconnects and to allow for adequate open space to construct multiple smaller facilities throughout the site to satisfy these requirements. Based on our preliminary review of the soils information it appears that infiltration of stormwater may not be achievable on site, thus facilities should be designed to incorporate underdrains.



Outdoor Learning area signage



View of SWM facility along Jefferson Pike



Blocked SWM inflow at north parking area



Pipe outfall at center of wetland area

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

SITE ANALYSIS (Continued)

SOILS

Site Soils

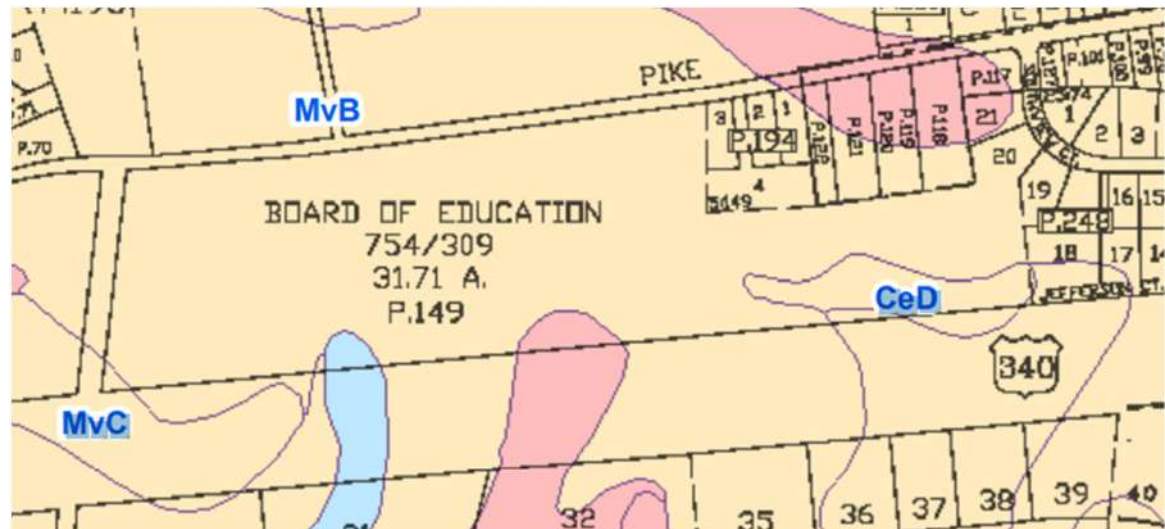
Per the Soil Survey of Frederick County Maryland, the soils on the site are in the Myersville silt loam (MvB), Rohrsersville-Lantz silt loams (RoB), Mt. Zion-Rohrsersville complex (MmB), and Catoctin-Spoonsville complex (CeD). The vast majority of the site is within the MvB zone. Generally, the depth to bedrock is usually between 71" to 81" in this zone. In terms of hydrology, most of the on-site soil groups are of hydrologic soil group 'B'. Hydrologic soil group 'B' has a good infiltration rate; therefore, future site expansions must take these factors into account for the location of BMP facilities.

Hydric Soils

Per the Frederick County Soil Map there is a small pocket of hydric soils on the site that would deter development in this area. This area lines up with the observed wetland and outfalls to US-340.



Soils Survey Map



Hydric Soils Map

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

SITE ANALYSIS (Continued)

Trees, Floodplains, Stream Valley Buffers and Non-Tidal Wetlands:

Currently the site is primarily open space with a buffer between US-340 and the school. East of the school between the ballfield and school is a designated school nature area. At the time of the field investigation, the area was saturated with wetland vegetation and flowing water. South of the playground is a daylighted pipe that had substantial flowing water, but the source of the pipe could not be determined. At this time, further investigation of this area is warranted, and it should be considered jurisdictional waters of the U.S.

The site is located outside of mapped floodplain in Zone "X" as shown per FEMA Flood Insurance Rate Map number 24021C0410D.

UTILITIES

Utilities

The site gains its dry utilities from Jefferson Pike. There are overhead wires along the road, but underground from the road under the parking lot and into the site. There is an electrical box at the Horine Road driveway (Box #13510). Telecommunications come from the same pole and are routed underground to the site.

Water is serviced by an existing private 4" waterline that is supplied by a FCPS-owned well directly adjacent to the school. The well is routed to an adjacent hydro-pneumatic tank and then into the school. Per conversations with the Health Department, the well (Permit number F-68-W-100) is 220' deep and provides a yield of 50 gpm.

The sanitary sewer is connected to the existing main within Jefferson Pike. The existing private pipe is a 6" clay pipe sloped at 5% which should provide more than adequate capacity for the school.



Pipe outfall at top of wetland area



Existing well and underground tank to north of school

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

SITE ANALYSIS (Continued)

PLAY AREAS AND ATHLETIC FIELDS

There is one large paved play area on site, located to the south of the building, adjacent to the gymnasium. This play area has basketball hoops and doubles as the drop-off loop.

There are two soft surface play areas on site. The larger one is located to the south of the building, just east of the paved play area and overlooking US-340. There is fencing and a tree line to separate the play areas from the highway. The smaller play area is located to the northeast of the building, adjacent to the kindergarten classrooms.

To the east of the building is a large open grassy field with a baseball backstop in its center. This field is used for physical education and some community use.



Northeast soft surface play



Southern paved play with Horine Road beyond



Southern soft surface play with building beyond

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

SITE ANALYSIS (Continued)

OUTBUILDINGS AND OTHER SITE FEATURES

There are four outbuildings located on site. All are simple shed-like structures. Two are located to the west of the gymnasium. One is located to the west of the softball field. The last one is located to the east of the wetland area. This one is fronted by a series of wooden benches that were utilized as an outdoor education space.

At the northeast corner of the Jefferson Pike frontage, there is a gravel access drive that leads to a gravel bus parking lot. Also along this edge is a gas line easement, which extends the width of the parcel, then turns and runs to the west parallel to US-340.



Shed adjacent to baseball field



Outdoor Storage facilities adjacent to Gym



Outdoor Education area shed

[illegible]

SCALE: 1" = 80'-0"

40' 0' 40' 80'

LEGEND

-  Media Center / STEM / MDF
-  Classroom - Grade 1 - 5
-  Building Support - Cust. / Maint.
-  Cafetorium / Stage / Food Service
-  Specials - Art / Music
-  Classroom - Pre-K / Kindergarten
-  Learning Supporting Services
-  Gymnasium
-  Administration / Health Suite
-  Corridors / Circulation

EXISTING FLOOR PLAN – SPACE USAGE DIAGRAM

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

ARCHITECTURAL ANALYSIS

GENERAL SPATIAL ANALYSIS

Valley Elementary School is a single-story building consisting of approximately 55,783 gross square feet. The main entrance to the school is located at the north side of the original building, facing Jefferson Pike, the bus loop, and the main parking lot. The primary entrance drive from Jefferson Pike slopes up from the roadway to the entry but the front façade is still visible from the road. There are two canopies along the building frontage, one at the main entrance, and one at the end of the central classroom wing. The canopies extend out to within just a few feet of the bus loop curb. The administration suite is located along the exterior wall facing the bus loop. The main office is not along the exterior wall, it is pulled in along the corridor and therefore does not have a direct visual connection to the exterior. A security vestibule renovation project was completed several years ago, which created a new interior vestibule and provided security cameras for improved visibility of the building exterior from the admin suite.

The main entrance opens onto an entry corridor that runs to the south of the building. The larger assembly spaces, including the cafetorium and the gymnasium along with their supporting spaces, the kitchen, stage, music room, and main mechanical/electrical room are located to the west of this corridor. The remainder of the building, including public restrooms to serve the assembly spaces, is located to the east of the main entry corridor. The assembly spaces, main entrance, administration suite, and one art room are all at the same floor elevation as the main entry. All spaces except the gymnasium were part of the original construction. The remainder of the building terraces down the hillside in two separate wings.

The cafetorium, gymnasium, and music room are all directly accessible from the main entry corridor. An operable partition separates the gymnasium and cafetorium. The gymnasium and cafetorium both also have direct egress to the exterior facing the rear play areas. The stage and music room are located on the opposite end of the cafetorium from the gymnasium. Their finished floor is approximately 2'-0" higher than the remainder of the building. A set of steps and an ADA platform lift provide access from the cafetorium to the stage. The lift was installed as part of a minor accessibility renovation project in 2001 and likely does not comply with all of the current codes. The music room can be accessed either by passing through the stage or directly from the security vestibule via a set of steps. It also has egress directly to the exterior facing the bus loop. The kitchen, loading area, and main mechanical/electrical room are located to the west of the cafetorium.

The administration suite is accessed directly from the main entry corridor. It includes a reception area, the health room, the Principal's office, the staff lounge, a workroom, a restroom, and a storage room. Immediately to the south of the administration suite, the main east-west corridor intersects with the main entrance corridor. Opposite the main east-west corridor is an art classroom. The main east-west corridor ramps down via a non-accessible ramp to the remainder of the building. The ramp slope just slightly exceeds the 1:12 maximum per ADA and it does not have compliant handrails. This corridor link is the only circulation route between the classroom wings and the assembly spaces.

The central wing is part of the original building construction and its floor level is approximately 1'-4" lower than the main entry level. The media center is located at the core of the central wing just to the south of the main connecting corridor. It is bounded by the MDF and media support spaces on its east side and by restrooms on part of its south side. The remainder of the south side and the entirety of the north and west sides are open to corridors and their boundaries are defined partially by furnishings. The restrooms along the south side include multi-user student restrooms and two single-user staff restrooms. These are the only dedicated staff restrooms in the building. A custodial closet is located between the student restrooms.

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

ARCHITECTURAL ANALYSIS

GENERAL SPATIAL ANALYSIS (Continued)

Two classrooms are located to the west of the media center across the makeshift corridor. This corridor leads to the southern classroom pod, which contains six classrooms arranged along a looped corridor that encircles a central open plan classroom and the Assistant Principal's office. Across the main east-west corridor to the north of the media center, a second classroom pod contains four classrooms arranged along a looped corridor that encircles a partially enclosed art classroom. The classrooms in these corridor wings are separated from the corridor by fixed walls, but from adjoining classrooms by operable partitions.

The main connecting east-west corridor extends beyond the media center with a ramp down to the 1973 addition. A second parallel corridor to the south of the media center also connects with a ramp to the addition. Neither ramp is ADA compliant because they exceed the 1:12 maximum per ADA and they do not have compliant handrails. A pair of cross-corridor doors at the top of the southern ramp reduces the upper landing so that it is also non-compliant. The addition classroom wing finished floor elevation is approximately 2'-0" below the central wing and 3'-4" below the level of the main entrance. This classroom wing is predominantly open plan with modular walls used to subdivide the space. There are a limited amount of fixed walls that enclose restrooms, storage spaces, and small support spaces. A fixed wall has been added at the north side of the main east-west connecting corridor to create a separate space for two kindergarten classrooms. The kindergarten classrooms each contain a single user and multi-user restroom and separate storage room. These two classrooms are separated from one another with modular walls. To the south of the main connecting corridor, seven classrooms have been created using modular walls. The classrooms are two deep along the east side of the main north-south corridor within the wing and at least two of these classrooms can be accessed only by passing through adjacent classrooms. Support spaces are located along the west side of the corridor. These include a conference room, math intervention, guidance counselor's office, computer lab, and storage. A speech room is located at the far southeast corner of the wing.

CONSTRUCTION TYPE SUMMARY

The original building and additions are constructed of masonry bearing exterior walls. Interior CMU walls are also used for intermediate bearing as required. Steel beams are used to span openings in the bearing walls. The structure is reinforced concrete slab-on-grade, except for a small area under the stage that is reinforced concrete elevated over an area originally used as a return air chase. Roof framing is steel joists with reinforced gypsum decking, except at the 1973 classroom addition which has metal deck. The original central classroom wing roof framing is divided into three spans, with two parallel bearing lines that consist of segments of masonry bearing walls with steel beams spanning between. The classroom addition is divided into two spans with a central masonry bearing wall between. The larger portion is clear span, allowing for flexible reconfiguration of space.



View of main entrance canopy from parking lot



Connection between central wing and classroom addition



1973 Classroom addition east elevation

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

ARCHITECTURAL ANALYSIS (Continued)

BUILDING ENVELOPE

The existing building is non-combustible construction. The structure is primarily masonry bearing with an exterior masonry façade. Exterior walls are composed of 8" CMU back-up with 4" face brick veneer. The majority of the veneer is rose face brick with some darker red face brick accents. The veneer is generally a simple running bond. Some decorative vertical recesses are utilized to create visual interest at the front wall of the cafetorium/music area, adjacent to the main entry. At the original building, the darker red brick is used as a 16" high band along the top of the exterior walls. The band is recessed approximately 3/4" from the face of the lighter brick below and is capped by an 8" course of CMU with adhered marble chips. Accent panels consisting of the same style of marble chips adhered to the CMU back-up are used around the classroom wing exterior door/window openings at the original building. Windows at other areas of the existing building that are not associated with door openings have brick rowlock sills.

At the classroom addition, the brick veneer is carried all the way to the door/window openings. The red color brick is used above the openings and as a continuous band at the top of the wall, while the rose face brick infills between openings. A brick rowlock sill course of the red brick color is used at the bottom of the window/door openings.



Main entrance and front façade with vertical recessed brick pattern



South side of art room and connector link between assembly area and classrooms



East side of classroom addition

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

ARCHITECTURAL ANALYSIS (Continued)

BUILDING ENVELOPE

The masonry is in fair to poor condition, with many areas which require repair and/or repointing. Large sections of horizontal mortar joints are missing around the entire perimeter of the original building. It is evident that the problem has been ongoing because there are areas that have clearly been previously repaired. The brick rowlock sills also require repointing. Some of them have significant algae growth, which may indicate that they are not shedding water efficiently after a rain event. The areas of the original building with the marble chips over CMU are exhibiting cracking throughout and have obviously been patched over the years.



Rowlock sills in need of repointing



Mortar joint repairs, cracking marble course



Areas of horizontal mortar joints missing



Detail of marble chip course cracking



Brick corner chipped and stairstep cracking

SECTION 4 | EXISTING CONDITIONS ASSESSMENT



Overview of built-up asphalt roof at original construction classroom wing



Standing water at roof area above main entry and administrative area

ARCHITECTURAL ANALYSIS (Continued)

BUILDING ENVELOPE (Continued)

With the exception of a few small door overhangs, the roof is an existing built-up asphalt roofing system with gravel surfacing. Two door overhangs at the south side of the building have sloped asphalt shingle roofs. The built-up roofing over the main entry level portion of the building has not been replaced since 1994. The built-up roofing over the two classroom wings was replaced in 2015. The original classroom wing steel structure appears to be installed flat, with no slope for roof drainage. When the roof was replaced in 2015 it appears that tapered insulation was used to achieve a 1/4" minimum slope to the internal drains. The classroom addition structural plans show the steel joists with a double sloped top for drainage from a central high point, however the slope is listed as only 1/8" per foot. When the addition wing was re-roofed, an additional 1/8" of an inch per foot slope appears to have been provided via tapered polyiso insulation in order to achieve a total slope of 1/4" per foot. Insulation values for the roofing system appear to average at least R-30, which is the energy code prescriptive minimum for this type of application. The new roof drains do not appear to have a gravel stop per the details and gravel extends right up to the drain. In general, roof areas dating back to 1994 are in poor condition. There are a number of significant areas of standing water and there is moss growth on the lower kitchen/mechanical roof area to the west side of the cafetorium. The recently replaced roofs are in good condition. None of the roofs appear to have secondary drainage systems. The vertical distance between the drain and the top of the gravel stop/coping would need to be measured and a calculation of the roof's structural capacity to withstand the resulting standing water run to determine whether this would meet current codes.

SECTION 4 | EXISTING CONDITIONS ASSESSMENT



Area of standing water at mechanical room roof



Main entry canopy roof



Deteriorating sealant at flashing reglet

ARCHITECTURAL ANALYSIS (Continued)

BUILDING ENVELOPE (Continued)

Transition ladders are provided for travel between the various roof elevations and generally appear to be code compliant in terms of dimensions and clearances. One of the shorter transition ladders appears to be anchored to the structure at only one location vertically and set down on wood blocking but does not appear to be permanently affixed thereto. We would recommend that the attachment methods be reviewed and modified to meet codes and provide stable transition.

At all areas except the classroom addition, roof edges have prefinished aluminum gravel stops with fascia trim rather than parapets. The new classroom addition has a parapet with a prefinished aluminum coping cap. There is one area of the loading dock roof that has a metal gutter which is full of leaves. Some of the existing sealants are starting to show signs of age and may need to be replaced soon.



Asphalt shingle overhang



Classroom wing roof drain



Loading Dock gutter



Roof transition ladder

SECTION 4 | EXISTING CONDITIONS ASSESSMENT



Original building typical classroom exterior door/window

ARCHITECTURAL ANALYSIS (Continued)

BUILDING ENVELOPE (Continued)

Exterior door frames and exterior window frames are prefinished aluminum. Exterior doors are painted hollow metal, with the exception of main entrance doors and frame, which have been replaced with an aluminum storefront door and frame. The frame and door units are in fair condition and most of them do not have ADA compliant hardware (they have knob style hardware). Exterior windows incorporate single pane glazing and the original building contains many operable window units, most of which are hopper style. The exterior window assemblies are not thermally efficient and are in need of replacement. Perimeter sealants at the door and window openings are also beginning to show signs of failure and should be replaced. The structural steel lintels above the window openings are showing signs of distortion and rust. See the structural report for additional information and recommendations. The rowlock sills at the addition exterior door/window openings were almost all damaged and/or missing adjacent to the doors, most likely due to impact during day-to-day activities and maintenance, along with thermal movement.



1973 addition typical exterior door & windows



Gym addition exterior door lintel distortion



Failing sealant at frame

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

ARCHITECTURAL ANALYSIS (Continued)

BUILDING INTERIOR

Wall construction and finish varies throughout the building. At the original building, all of the exterior and interior walls constructed as part of the original construction are painted CMU. All exterior walls at the additions are also painted CMU. The only metal stud and gypsum board walls are those which were constructed for smaller support spaces within the 1973 addition. These walls are typically painted gypsum board. The central classroom wing corridor walls that were part of the original construction include some painted wood Tex-111 paneling above door and window openings where CMU bearing walls are not continuous. Walls between classrooms in this wing are mostly operable panels. Classroom walls at the 1980 addition are demountable partitions.

The gymnasium and cafetorium walls are painted CMU. Darker accent colors are used down low with lighter neutral shades above.



Security Vestibule and main office



View of main east-west corridor toward east



View of main entrance corridor toward gym



View of makeshift west media corridor

SECTION 4 | EXISTING CONDITIONS ASSESSMENT



View of gymnasium

ARCHITECTURAL ANALYSIS (Continued)

BUILDING INTERIOR (Continued)

The administration suite walls are also painted CMU. The media center has a combination of painted CMU and painted wood paneling walls. Restrooms throughout the building have painted CMU walls.

Corridors at the original building have terrazzo flooring with vinyl wall base. Corridors at the classroom wings are primarily carpet, but sometimes VCT. There is some existing asbestos containing tile remaining in selected areas of the building, mostly storage closets. Restrooms have ceramic tile flooring with either ceramic tile or vinyl wall base. The gymnasium, cafetorium, music, and art classrooms have vinyl composition tile flooring with vinyl base. The majority of the media center, along with its support spaces, and the administration suite are carpeted, except for the health room and workrooms, which have vinyl composition tile. The majority of these areas have vinyl wall base.



Administration area workroom



Multi-user restroom with painted CMU walls, ceramic tile flooring, and vinyl base



Multi-user restroom with painted CMU walls, ceramic tile flooring, and tile base

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

ARCHITECTURAL ANALYSIS (Continued)

BUILDING INTERIOR

Classrooms are predominantly carpeted, except for some areas of vinyl composition tile adjacent to the classroom sinks. Supporting services offices and small group rooms are mostly carpeted. Vinyl wall base is used throughout the classroom and office spaces.

Ceilings are generally 2'x4' acoustical tile. The original building has mostly surface mounted or suspended light fixtures due most likely to the very limited space between the ceilings and steel structure above. The classroom addition has 2'x4' ACT with recessed 2'x4' fluorescent lighting fixtures. The gymnasium has an exposed structure ceiling with suspended light fixtures. Multi-user restrooms have perforated acoustical panel or painted gypsum board ceilings. Mechanical rooms and some storage closets have exposed structure ceilings.



View of stage



View of cafeteria looking towards gym



View of music classroom



View of media center

SECTION 4 | EXISTING CONDITIONS ASSESSMENT



Typical original classroom with windows to corridor & wood paneling



Typical addition wing classroom with demountable wall

ARCHITECTURAL ANALYSIS (Continued)

BUILDING INTERIOR (Continued)

Interior doors are generally prefinished wood in either wood or painted hollow metal frames. Much of the interior glazing is wired glass, which is no longer permissible by code. Restroom toilet partitions are either phenolic or baked enamel. Classroom casework is generally minimal and is constructed of wood. Most classrooms have base cabinets with laminate clad countertops and a sink. Some wood cubbies are located in the corridors of the original classroom wing. The majority of the casework is in fair condition.

The majority of classroom spaces have windows to the exterior that provide daylight and views, except for those at the interior portion of the classroom addition. The majority of smaller support spaces and offices, along with the media center, do not have views to the exterior or natural daylight.

Nearly all of the existing fixtures, built-in casework, and finishes are starting to show their age and replacement of all existing items should be considered when defining the scope of work for any renovation options.



Views of art classroom

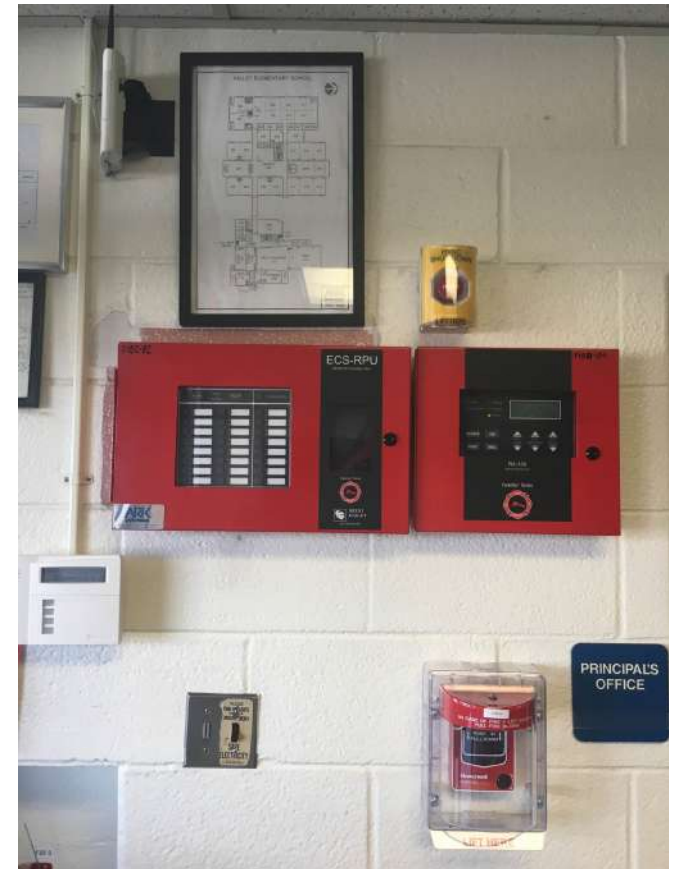
SECTION 4 | EXISTING CONDITIONS ASSESSMENT

BUILDING CODE ANALYSIS

Building code requirements have changed significantly since the last addition was constructed, however it is anticipated that the building construction would be considered type IIB. Use Group Classification is Type “E”, Educational. The building is not currently sprinklered. Without a sprinkler system, buildings of this type are limited to 14,500 GSF per floor. This could be increased by up to 10,875 GSF if 100% frontage access is maintained, which would allow for a total area per floor of 25,375 GSF. The existing building appears to exceed this size and there is no evidence of any interior fire rated walls that would act as firewalls to separate the existing square footage in order to comply. A sprinkler system will need to be installed throughout any portions of the existing building that are to remain.

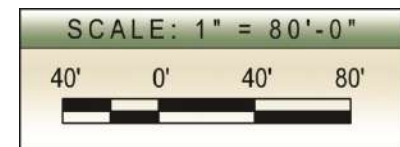
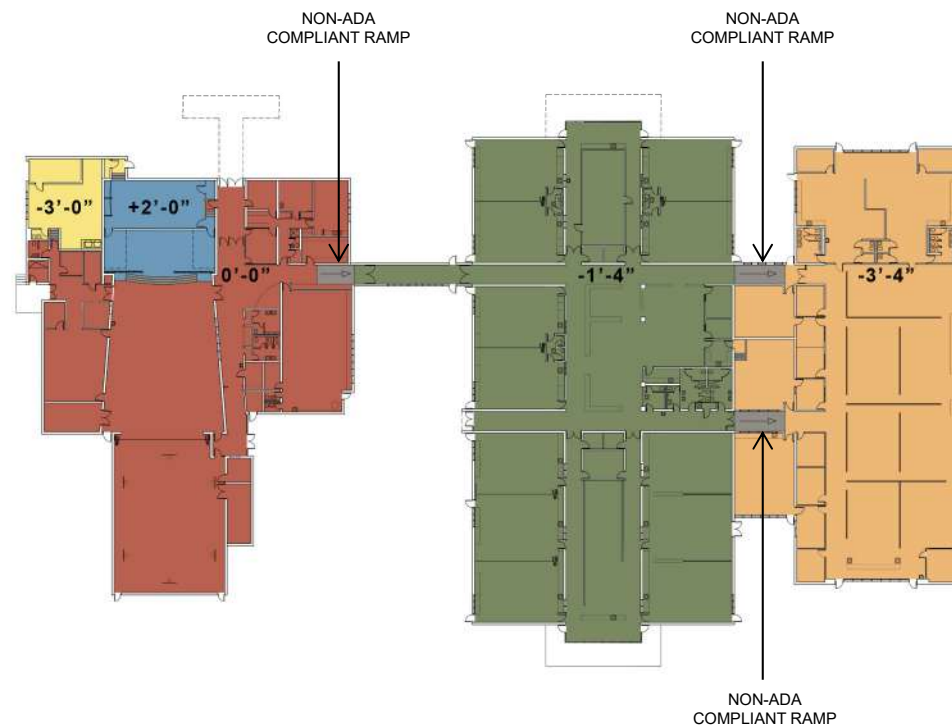
Given the current codes, for type IIB construction the maximum allowable area per floor for this use would be 43,500 GSF using area increases for a sprinkler system and assuming a multi-story building will be constructed. Use of a frontage increase could allow for a slightly larger footprint, however the total frontage increase will be dependent upon the final building configuration and even the greatest possible increase will not yield an allowable floor area of 84,000 GSF as would be required to meet the Ed Specs. This means that the proposed additions will likely need to be separated from the existing structure by a two-hour fire wall. Building height regulations for this type of building allow for a three-story structure up to 75 feet tall with a sprinkler system.

There were some areas of 9"x9" floor tile visible during the site inspections that clearly appeared to be asbestos type. Additionally, per the reports provided by FCPS some of the 12"x12" floor tile and other materials, including gym floor tiles, carpet mastic, and transite wall board contain asbestos. All these materials will require abatement as part of any demolition or modernization project.



SECTION 4 | EXISTING CONDITIONS ASSESSMENT

BUILDING CODE ANALYSIS



EXISTING FLOOR PLAN – FINISHED FLOOR LEVEL DIAGRAM

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

BUILDING CODE ANALYSIS

SUMMARY OF ACCESSIBILITY COMPLIANCE

Generally, the school needs major renovations to be brought up to current code requirements for ADA compliance.

There are a number of ADA Compliance issues that should be addressed as part of the scope of work. The Accessibility Survey conducted by Proffitt & Associates Architects in 2014 details the non-compliant elements. A partial list is as follows:

- None of the ramps between wings are ADA compliant due to their steep slope and lack of compliant handrails.
- There are protruding objects in circulation paths.
- Objects are mounted outside of accessible reach ranges (light switches too high, etc.)
- Several doors (mostly restrooms and storage rooms) are not 36" wide
- Numerous doors, including all classroom doors at the original building, do not have required door maneuvering clearances or level landings
- Door hardware on some doors is non-compliant (knob-style hardware is used).
- Restrooms are not ADA compliant. Many restrooms lack turning space and required clearances or do not contain accessible stalls or plumbing fixtures. Compliant grab bars are not typically provided.
- Plumbing fixtures such as classroom sinks and drinking fountains are not accessible.
- Parking areas do not comply with requirements for quantities of handicapped parking spaces or handicapped parking signage



Corridor ramp is non-compliant due to slope and lack of railings



ADA stall dimensions are not met and required grab bars not provided



Single-user toilet rooms are not ADA compliant due to size and door width



Many exterior egress doors do not have level landings at the exterior

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

FOOD SERVICE ANALYSIS

GENERAL DESCRIPTION

Valley Elementary School kitchen contains approximately 1,000 square feet and operates as a full-service prep/production facility equipped to produce and serve meals to the students and staff. Most of the equipment, is old, outdated, inefficient, non-compliant with current codes, and has seen its useful life.

EXISTING CONDITIONS:

FINISHES

Floors

Kitchen and serving areas are thick-set quarry tile with coved base. Although old most tiles appear in sound condition, grout is soiled and stained. Due to smooth surface, tiles are very slippery when wet or laden with grease.

Walls

Painted. Old “institutional” off white in color and does not provide inviting atmosphere.

Ceilings

12"x12" perforated ceiling tiles throughout kitchen, dry storage, and serving area. Ceilings are not compliant with COMAR 10.15.03.21.N(1) *Tiles are faced with smooth, washable surface: and do not contain fiberglass backing.*

Lighting

Twin bulb surface mounted light fixtures. Light level throughout space varies and is not adequate and some areas are not within current code standards.



Kitchen work area with quarry tile flooring



View of perforated ceiling tile

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

FOOD SERVICE ANALYSIS (Continued)

AREAS

Receiving

Includes double 3'-0" doors with screen door wide enough to accept palletized merchandise for deliveries. There is sufficient overhang above the door for inclement weather.

Dry Storage

There is one dry storage room. Product is stored on shelving and stacked on the floor. The space is small and has limited storage capacity. Walls are painted. Floors are quarry tile. Poor light level.

Walk-in Cooler Compartment

Unit is old and in fair/poor working condition and in constant need of repair. It is undersized for the number of students anticipated and is typically filled indicating the need for larger units. Flooring is galvanized steel and slippery when wet, adding to maintenance problems.



View of surface mounted lighting



Receiving Area



Walk-in Cooler



Reach-in Refrigerator and Freezer

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

FOOD SERVICE ANALYSIS (Continued)

AREAS

Reach-In Refrigerator/Freezer

There is one 2-section refrigerator and two 2-section freezer. Life cycle for this equipment is typically 10 years with normal wear and tear.

Kitchen

Amount of equipment is based on the current number of students in the school. Additional cooking equipment will be needed to properly prepare current menu items for the number of new students that are expected in the future. The space is overcrowded with little food prep area.

Serving

Serving counters consists of one straight-line cafeteria-style counter with provisions for hot and cold items. They are old but in good working order.

Dishwashing

The Dish room equipment have been removed with the exception of the condensate hood still in place.



View of Serving line



View of dishwashing area with equipment removed

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

FOOD SERVICE ANALYSIS (Continued)

EQUIPMENT

Exhaust Hood - Hood is type 1 hood, made of galvanized steel with aluminum baffle-type filters. No longer Code Compliant.

Fire Protection System - There is an existing fire protection system in the Kitchen and a handheld fire extinguisher, Type K.

Current Cooking Equipment

- (1) Steamer single stack, electric
- (1) Double-Deck Convection Oven, electric
- (1) Full size Heated Cabinet

Worktables, Prep Sinks, Pot Sinks, and Hand Sinks - Original to building. Pot sink is in good/fair condition. Worktables are a repurposed baker's table and a table with a stainless-steel top and galvanized base which should be painted or replaced. The number of hand sinks is insufficient, not in compliance with current health code. Hand sinks are also made of porcelain.



Exhaust Hood



Cooking Equipment



Work counter area

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

FOOD SERVICE ANALYSIS (Continued)

CONCLUSIONS

The kitchen needs an update and better organization. A portion of the equipment has either seen its' useful life or is in violation of current health codes. Replace all outdated inefficient equipment with new energy saving appliances according to FCPS current menu. Student participation could be increased with a more inviting dining experience. Select bright colorful attractive finishes to promote friendly inviting atmosphere. Improve lighting and ventilation throughout space. The total square footage of the existing foodservice area(s) is under the current State recommendations.

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

STRUCTURAL ANALYSIS

Existing Structure Condition

The Valley Elementary School building was built around 1967 with one addition constructed in 1973. The structural condition of the school and the addition is generally good, though ***a moderate amount of structural remediation is required if the existing structure is reused.*** Even though the structure has performed well up to this point, it does not meet current codes and would not be able to withstand a large wind or seismic event without major damage.

The existing building is one-story and consists of three main wings:

- a) The core wing was constructed in 1967 and 1973. The original construction built in 1967 is composed of administrative offices, kitchen, cafetorium with stage, and the mechanical rooms. The attached gymnasium was built later in 1973.
- b) The first classroom wing was constructed in 1967 and includes the media center.
- c) The second classroom wing was constructed in 1973.

1967 Building

- The 1967 structure consists of interior and exterior 12" thick unreinforced masonry bearing walls supporting steel joists. The exterior walls consist of 4" thick brick veneer and 8" thick unreinforced concrete masonry block (CMU). The large wall openings are framed with steel beams (W8 and W16) supporting the exterior wall above. The interior walls consist of unreinforced 12" CMU walls and pilasters, and (4) steel columns.
- The slab on grade is 4" thick concrete reinforced with steel wire mesh. The foundations are unreinforced concrete strip footings bearing on soil of unknown bearing capacity.
- The roof is 2" thick poured gypsum with embedded steel wire mesh on steel deck. The typical steel joists are 14" to 20" deep spaced at 4' on center. The joists in the cafetorium are 24" to 28" deep spaced at 4' on center.

1973 Building Additions

The 1973 additions consist of 2 structures.

- The classroom wing addition consists of exterior 12" thick unreinforced masonry bearing walls supporting long steel joists. The one interior load-bearing wall is also 12" thick CMU. The exterior walls consist of 4" thick brick veneer and 8" thick unreinforced concrete masonry block. The large wall openings are framed with steel beams (W8 thru W18) supporting the exterior wall above.
 - The slab on grade is 4" thick concrete reinforced with steel wire mesh. The foundations are reinforced concrete strip footings.
 - The roof is 1 ½" deep steel deck. The typical steel joists are pitched to a ridge at midspan, 36" deep at bearing, 40" deep at midspan, spaced at 4' on center.

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

STRUCTURAL ANALYSIS (Continued)

- The gymnasium addition consists of exterior 12" thick unreinforced masonry bearing walls supporting long steel joists. The exterior walls consist of 4" thick brick veneer and 8" thick unreinforced concrete masonry block.
 - The slab on grade is 4" thick concrete reinforced with steel wire mesh. The foundations are reinforced concrete strip footings.
 - The roof is 2" thick poured gypsum with embedded steel wire mesh on 1" thick mineral fiber board. The steel joists in the gym are 26" deep spaced at 4' on center; they support RTUs and one basketball backboard. A large steel beam was added to support the long bulkhead and folding partition between the cafeteria and gym.

STRUCTURAL Issues Observed

From our visit to the school on 28 December 2020, we have the following observations:

1. The exterior walls in the first classroom wing are cracked at approximately 7 exterior lintels. [See Photos 1A, 1B]

- 1.1 Recommendation: Expose the steel lintels and beams and remove all rust, repaint, or replace; Rebuilding the masonry jambs at these locations from slab on grade level to lintel elevation.



Photos 1A and 1B: First classroom Wing – Steel Lintel and CMU jamb damage

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

STRUCTURAL ANALYSIS

2. The southwest corner of the first classroom wing is experiencing some distress, stair-step cracks, pavement settlement, lintel cracks, possibly all due to settlement. [Photo 2]
 - 2.1 Recommendation: Demolishing the wall in this corner to the foundation level, verifying the soil bearing does not need remediation, and then rebuilding the wall.
3. The exterior wall lintels at the southeast and northeast corners of the first classroom wing appear to be significantly rusted. These lintels consist of W8 beams with a steel plate welded directly to the bottom flange. [Photo 3]
 - 3.1 Recommendation: Remove these W8 lintels and rebuild a CMU lintel over the windows at these two (2) locations.



Photo 2: First Classroom Wing SW corner – possible foundation settlement



Photo 3: First Classroom Wing East corner lintels – replace lintel beam

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

STRUCTURAL ANALYSIS (Continued)

4. The exterior wall lintels at the East face of the second classroom wing are all (4) structurally damaged. [Photo 4A and 4B]
 - 4.1 Recommendation: Remove these W18 lintels and rebuilding a new CMU lintel over the windows at these four (4) locations.



Photos 4A and 4B: Second Classroom Wing East side lintels – replace lintel beam and masonry jambs

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

STRUCTURAL ANALYSIS

5. Lintels at exterior wall of gym and gym vestibule were extremely corroded.

5.1 Recommendation: Remove these 2L and W12 lintels and rebuilding a new CMU lintel over the doors and storefront at these four (4) locations. [Photo 5A and 5B]

6. The steel joists over the stage supporting the AHUs appear to be rusted in two areas.

6.1 Recommendation: These joists may need to be remediated with misc. steel reinforcing.

Representation

ADTEK Engineers, Inc. has observed the structure described in this report in accordance with our understanding as to the nature and scope of the assignment. Our examination was made within the time limitations imposed following the generally accepted visual inspection standards; our examination did not include the testing of physical conditions that may be referred to in this report. Unless otherwise stated, ADTEK has reported on only those items that we were able to visually inspect. It was not possible, nor was it feasible to remove major portions of the existing finish construction in order to expose concealed, and thus not apparent conditions for an internal detailed inspection. The information provided to us the existing construction documents including Architectural and Structural drawings.



Photos 5A and 5B: Gym and gym vestibule lintels – replace lintel beam and angles

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

MECHANICAL SYSTEMS

I. EXISTING MECHANICAL SYSTEMS

A. UTILITIES:

1. Water: The existing building is served by an existing private water service. An existing well provides water to an underground 5000-gallon hydropneumatic tank. The well and tank are located adjacent to each other on the North side of the West end of the building.

The existing hydropneumatic tank is located between the paved driveway area and the building. A new water filtration and chemical treatment system has recently been installed in the outside storage room. The piping from the submersible well pump has been replaced to now enter this storage area and is provided with chemical treatment and sediment filtration before returning outside, underground to the existing underground hydropneumatic tank. The associated well pump controller and tank level gauge located in the same Storage Room appear to be original to the 1967 building construction. The 3" cold water service from the hydropneumatic tank feeds a domestic hot water heater in the Boiler Room. Domestic hot and cold water piping distribution systems then leave the boiler room to serve the building. It is our understanding that high iron levels were a concern but were reduced with the current chemical treatment filtration system. The makeup water for mechanical systems is also being softened.

It is our understanding that public water is available in the street and can be extended to serve the building.

2. Sanitary: The existing building is served by a public sewer system. A grease interceptor serving the Kitchen, is located at the West end of the building behind the Kitchen Area, outside, underground, and adjacent to the Driveway and Loading dock.
3. Natural Gas: Natural gas from a Washington Gas main gas pipeline is reduced to 5 psig through a gateway located at the northwest corner of the site. A gas meter and regulating valve are in front of the service area screen wall where the pressure is further reduced. Natural gas enters the building and serves the boilers, domestic hot water heaters and kitchen equipment.



Water Treatment system



Grease Interceptor access



Washington Gas pipeline gateway

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

MECHANICAL SYSTEMS (Continued)

B. MECHANICAL SYSTEMS:

1. General: All building areas have air conditioning, ventilation and heating. The building is served by a 2-pipe dual temperature central plant system serving various types of heat transfer equipment (e.g., unit ventilators, fan-coil units, and air handling units).
2. Central Heating and Cooling Plants and Distribution System:
 - a. Heating Plant: The building is heated by a 2-pipe dual temperature distribution system serving terminal units. Heating-only terminal units, such as convectors, finned tube radiation, and unit heaters, are supplied with heating water only when the Central Plant is in the heating mode. Three (3) high efficiency condensing type boilers (Advanced Thermal Hydronics, model KN16) are each rated for 1600 MBH input. The boilers were installed in 2015 and generate the required heating for the Facility. Each boiler has an in-line primary circulating pump.
 - b. Chilled Water Plant: Cooling is provided to terminal heat transfer units through the dual temperature piping distribution system. Chilled water is generated by a single water-cooled indoor screw chiller (York model YCWS0200) and uses R22 refrigerant. The chiller was installed in 2004. The chiller has a nominal capacity of 170 tons. Heat is rejected to the atmospheric heat sink via a cooling tower. The cooling tower type is an induced draft counterflow type, utilizing an axial type fan. The cooling tower was manufactured by Baltimore Air Coil, Model No. 15176 and was installed with the chiller in 2004.
 - c. Distribution System: The dual temperature pumps (lead and standby) and condenser water pumps were replaced with the chiller and cooling tower in 2004/2005. The pumps are base mounted end suction type as manufactured by Taco. All pumps are constant flow, the dual temperature pumps are rated for 365 GPM and the condenser water pump for 485 GPM.



High-efficiency condensing-type boiler



Cooling Tower



Water cooled chiller

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

MECHANICAL SYSTEMS (Continued)

3. Room Terminal Units:

- a. General: The existing building is served by a dual-temperature (chilled water/heating water) 2-pipe hydronic distribution system serving various types of terminal units. Heating only terminal units such as finned tube radiation, convectors, cabinet unit heaters and unit heaters connected to the two-pipe system only function when the Central Plant is in the heating mode.
- b. Classrooms and Media Center: Classroom spaces and the Media Center are served by 2-pipe unit ventilators. Perimeter classrooms utilize vertical style unit ventilators with intake louvers through the exterior wall. Interior Classrooms utilize above-ceiling type unit ventilators with roof outdoor air intake vents. All unit ventilators have constant water flow with face and bypass damper temperature control. Fan-coil units equipped with modulating 3-way automatic temperature control valves serve smaller support spaces and the office. Independent direct expansion (ductless mini-split) system serves the Computer Room and MDF room. Strategically located gravity type roof vents relieve excess outside air being brought in by the unit ventilators.
- c. Cafetorium: The Cafetorium is served by two (2) indoor air handling units ceiling-hung, at both ends of the Stage. The units designated as AHU#1 and #3 are equipped with a mixing box, filter, face and bypass damper, dual temperature coil, and supply air fan. Each unit has an airflow rate of 2400 cubic feet per minute (cfm) or a total flow rate of 4800 cfm to the space. A gravity type roof vent relieves excess air to maintain a slight positive space pressure.
- d. Gymnasium: The Gymnasium is served by a single indoor air handling unit, ceiling-hung, located above the adjacent Storage Room. The unit is equipped with a mixing box, filter, face and bypass damper, dual temperature coil and supply fan. The unit has an air flow of 6000 cfm. A gravity type roof vent relieves excess air to maintain a slight positive space pressure.



Typical Classroom unit ventilator



Access door to mechanical platform above stage



Gym unit hung in storage room

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

MECHANICAL SYSTEMS (Continued)

- e. Office / Administration Suite: The Office / Administration Suite is served by a single indoor air handling unit, vertical up flow ducted type, located in the General Storage Room. The air handling unit is designated as AHU-2. The unit utilizes a roof mounted heat pump, using refrigerant R-22, and has an auxiliary electric heater (residential type unit). Hot water finned tube radiation located at the building perimeter provides the primary heating while the unit electric heating coil provides supplemental heating when the heat pump is in the defrost mode or when supplemental heat is needed.
- f. Kitchen Make-Up Air Unit: An indoor heating and ventilating make-up air unit serves the Kitchen. Heating is provided to the unit from the dual temperature loop when the Central Plant is functioning in the heating mode. The unit functions at 100% outside air and has an airflow capacity of 6000 cfm. The unit is equipped with filters, face and bypass damper, heating coil and supply fan.
- g. Automatic Temperature Control ATC System: The system still utilizes pneumatic controls for actuation of dampers and valves. There is some Johnson Controls that serve the central heating and cooling plant and overlays the existing Barber Coleman Controls serving spaces. The Johnson Control system can monitor space temperatures and provide OCC-UNOCC Controls for scheduling.



Kitchen make-up air unit hung from structure in adjacent storage room



Air compressor for pneumatic controls

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

MECHANICAL SYSTEMS (Continued)

C.PLUMBING SYSTEMS:

1. Cold Water: As previously stated, a single 220-foot deep well with a 50-gallon per minute submersible pump provides water to a main underground 5000-gallon hydropneumatic storage tank. Chemical treatment is injected into the 2-inch well pump discharge line, which then circulates through a depth filter and sediment cartridge filter before returning to the underground hydropneumatic storage tank.

A 3-inch supply line from the hydropneumatic tank serves the building and domestic hot water generator. This water service enters the outside storage room and then into the existing boiler room, where it feeds the domestic hot water heaters, then both domestic hot water and cold water are distributed throughout the building via overhead piping systems.

A water softener is located in the boiler room and is installed in the make-up water line serving the dual temperature system and condenser water system.

2. Domestic Hot Water: Domestic hot water serving the building is generated by two (2), 130 gallon, gas fired high efficiency hot water generator (PVI Conquest 130 A-GCML). Each hot water heater has an input rating of 500,000 BTUH and a capacity of 588 gallons per hour at a 100 degree F temperature rise. The hot water heaters were installed in 2015.
3. Plumbing Fixtures: It appears that most plumbing fixtures are original.
4. Storm Water: The existing storm water system consists of roof drains and an internal collection system which is piped to the building exterior where it outfalls on grade at two (2) separate locations. A secondary drainage/overflow system does not exist.
5. Fire Protection: A sprinkler system does not exist for the building.



New hot water heater



Typical wall hung lavatories

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

MECHANICAL SYSTEMS (Continued)

II. MECHANICAL SYSTEM/EQUIPMENT EVALUATION:

A. GENERAL:

The buildings original central heating and cooling plant were replaced and are in good condition however the Air Handling Equipment (AHU's, UV's, FCU's, CUH's), piping distribution systems and controls are for the most part original and at the end of its useful life. Similarly the plumbing systems are original except for the domestic water heaters which were recently replaced.

B. MECHANICAL SYSTEMS:

1. Heating Plant: The boilers are high efficiency type, gas fired, coated cast iron type and provide turn down capability and redundancy (piped in parallel). The heating plant is approximately five (5) years old with an anticipated life expectancy of 20-25 years.
2. Cooling Plant: The cooling plant consist of a water cooled multiple compressor screw chiller utilizing refrigerant R-22 (no longer manufactured) and is 16 years old. The chiller and cooling tower are in good shape and have a 20-25 year life expectancy. The capability of the cooling plant may not be adequate to support an addition or current ventilation rate requirements. Typically air cooled chillers are used for Elementary School buildings that utilize a private water well instead of public water.
3. Distribution System: The existing 2-pipe dual temperature heating / chilled water circulating system piping is beyond its useful life; and can either provide heating or cooling to the building but not simultaneously like a 4-pipe system.
4. Terminals: All the existing terminal type devices (AHU's, Unit Ventilators, Cabinet Unit Heaters etc.) are original and are at the end of their useful life. The manufacturer of equipment is no longer in business and parts need to be custom fabricated. Water infiltration and high humidity levels can occur as a result of the close proximity (and at-grade) of the low perimeter intake louvers connected to the vertical unit ventilators.
5. Automatic Temperature Control (ATC) System: The ATC system still utilizes pneumatic actuation and is a combination of new Johnson Controls overlaid on the original Barber Colman ATC system.

C. PLUMBING:

1. Distribution: The domestic cold water, hot water, and hot water recirculating lines are at the end of their useful life and need to be replaced. Current codes require the potable water system to use lead free certified products and ASSE 1070 temperature limiting valves at faucets.
2. Fixtures: The existing fixtures are original, do not meet current ADA Code requirements or the Water Conservation Act.
3. Storm Water: An independent overflow system is required to meet current Code requirements if the structure cannot support ponded water.

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

ELECTRICAL SYSTEMS

III. ELECTRICAL SYSTEMS EVALUATION

A. UTILITIES:

1. Normal Power Distribution: The existing electrical service consists of a Cutler-Hammer PRL4 Panelboard (1997) consisting of an 800 Amp, 277/480 Volt, 3-Phase, 4-wire service. The existing Allegheny Power utility transformer (#13510) is located near the boiler room at the northwest of the building. Branch panelboards scattered throughout the building are a mixture of GE, Square-D, and Cutler-Hammer; with the most recent panel being installed in 2001.
2. Emergency Power Distribution: There is currently no generator or provisions to accept secondary power. Life safety loads do not have a secondary source of power. During a power outage, no loads remain running & battery wall packs are used as emergency lighting.

B. ELECTRICAL SYSTEMS:

1. Lighting: There is a mixture of fluorescent 2' x 4' surface and recessed 4-lamp fixtures as well as 1' x 4' surface-mounted 2-lamp fixtures throughout the building. The existing gym and cafetorium use 2' x 4' industrial high bay fixtures. The site lighting is provided by Cobra head type light fixtures on steel poles as well as 1' x 1' square canopy surface mounted fixtures and wall packs around the perimeter of the building. There are currently no lighting controls to detect occupancy/vacancy. Toggle switches are used throughout the building.



Electrical equipment and panels



Electrical transformer near Horine Road access

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

ELECTRICAL SYSTEMS

2. Security System: Motion detectors have been installed near entrances and by windows. Cameras have been installed around the perimeter of the building and in the main office.
3. Access Control System: The school has a BEST Access Control System utilizing card readers and Aiphones at the main entrance.
4. Master Clock System: Existing Master Clocks (Analog type) are connected to the exiting Latham Master Clock / Bell System LTR2-384.
5. Voice Network – Telephone / Paging / Intercom System: The incoming telephone service is a 25-pair cable terminating in the Boiler Room. There is an existing Telecor main console located in the main Office. The PA console includes a power supply and a desktop microphone. The existing PA System uses a combination of wall-mounted & ceiling-mounted speakers.
6. Data Network: Currently, there exists one (1) MDF (Media Center Room 207). There is a mixture of Category 5E and Category 6 data cabling for data/security. With the installation of new smartboard technology, the coaxial video cabling system throughout the school was observed to not be in use.



Typical surface mounted lighting at original classroom wing



MDF closet adjacent to Media Center

SECTION 4 | EXISTING CONDITIONS ASSESSMENT

ELECTRICAL SYSTEMS (Continued)

IV. ELECTRICAL SYSTEMS RECOMMENDATIONS

A. UTILITIES:

1. Normal Power Distribution: It is recommended to increase the capacity and size of the incoming service to be a 2000A, 277/480 Volt, 3-Phase, 4-Wire Panelboard to accommodate any future additions or loads that may added. Branch panelboards should also be replaced since they are either at or approaching their recommended lifespans.

2. Emergency Power Distribution: It is recommended that provisions to accept a secondary source of power should be implemented. 2 automatic transfer switches (ATS's) for life safety and non-life safety loads should be installed to enable critical loads to remain running during an outage. For the secondary source of power, it is recommended that an emergency generator be installed, but a docking station that could accept power from a roll-up generator is an acceptable replacement.

B. ELECTRICAL SYSTEMS:

1. Lighting: It is recommended that all lighting fixtures be replaced with new LED-Type fixtures. Lighting controls should be added to allow customizable dimming and occupancy/vacancy sensing capabilities and to meet current energy codes. The overall efficiency of the building will increase with the change to LED fixtures.

2. Fire Alarm System: The fire alarm system seems to be in good condition and meet ADA requirements, as it was installed in 2018.

3. Security System: Security cameras around the perimeter and in the office are in good condition and properly cover the perimeter of the building, therefore we see no need to upgrade security.

4. Access Control System: The card reader and Aiphone seem to be in good condition. Owner may want to consider adding card reader to other entrances for accessibility.

5. Master Clock System: The existing Latham Master Clock System is in fairly decent condition. If desired, digital clocks could be installed throughout the building, which may require a new master clock system.

6. Voice Network – Telephone / Paging / Intercom System: The cabling for the data network is fairly up-to-date to incorporate the new security and smartboard technology that was installed.

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SECTION 5:

PLANNING AND DESIGN CONSIDERATIONS

- Energy Use and Sustainability
- Options for Relocation of Students During Construction
- Design and Construction Recommendations
- Compliance with Environmental Regulations
- Local Planning Initiatives
- Historical Significance of Existing Buildings
- Proposed Project Schedule

SECTION 5 | PLANNING AND DESIGN CONSIDERATIONS

ENERGY USE AND SUSTAINABILITY

The Option 3 replacement building will be designed to achieve Silver level certification under the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) for Schools Rating system, however actual certification of the projects through GBCI will not be required. Due to their lesser new construction scope, Options 1 and 2 will not be required to achieve LEED certification. Given the fairly rural nature of this site, it will not qualify for many of the Location and Transportation LEED credits. Other areas of design that will be addressed per LEED are sustainable site development; including stormwater management, reductions to impervious areas, reducing light pollution and heat island effect. Water use reduction and energy efficiency are critical not only from an environmental perspective, but also from a long-term maintenance cost perspective. Additional sustainable design features will include selection of environmentally preferable and low-emitting materials, provision of daylight and views, controllability of HVAC and lighting systems, and acoustical performance. These items are not only good sustainable practices, but also help to enhance occupant comfort and make the learning environment more effective for students and staff.

In addition to LEED, for all options any new or replacement building components and systems will also need to comply with the current version of the International Energy Conservation Code. Many of these requirements overlap with the LEED requirements for energy and water efficiency. Building energy modeling will be required in order to verify and quantify energy savings. Modernization and modernization/addition options are approached slightly differently than new construction both from a LEED and Code perspective, however since the entire existing building to remain will be modernized, all new components will be required to comply with current codes.

OPTIONS FOR STUDENT RELOCATION DURING CONSTRUCTION

For Options 1 and 2, portions of the existing building will remain occupied during construction. In Option 1, up to 12 relocatable classrooms will need to be brought onsite prior to beginning the construction in order to allow for existing areas to be vacated for renovations to occur in two phases. The eastern classroom wing could be renovated the first year and the center classroom wing and media center could be renovated the second year. Core spaces, administration areas, and vehicular areas will be renovated during summer breaks. In Option 2 the single-story gymnasium/cafetorium addition would be the first phase of construction. Prior to starting that work, the administration area will need to be relocated in order to maintain access. Once the core spaces are complete, students can be moved in and the existing gymnasium/cafetorium demolition work can begin, followed by the classroom addition. The addition will provide all required Pre-K/K classrooms and 10 typical classrooms for use. Depending on the capacity of the school at the time that the project starts, up to 8 additional relocatable classrooms may be required to be placed on site in order to complete all the modernization work simultaneously.

In Option 3, the entire new building would be constructed while the entire existing building remains operational, which means that no additional relocatable classrooms will be required. Generally, for all options sitework will be scheduled to occur over the summer when possible to minimize disruption to operations. Phases would be timed to start and end over the summer so that staff and students can be relocated during summer break.

SECTION 5 | PLANNING AND DESIGN CONSIDERATIONS

DESIGN AND CONSTRUCTION RECOMMENDATIONS

All new construction, including modernization, additions and replacement facilities, will contain the following elements (these elements are assumptions for development of the conceptual cost estimates but the ultimate design may vary):

ARCHITECTURAL DESIGN

CONSTRUCTION OF THE ADDITIONS/NEW FACILITIES

- All additions will be reinforced slab on grade construction. The foundation system is anticipated to consist of continuous strip footings at the exterior walls with spread footings and concrete piers as required at column locations. The structures will be steel frame construction. Second floor levels will be composite concrete on steel deck and steel beams.
- The new construction will receive steel joist roofing systems sloped at 1/4" minimum per foot, topped with metal deck, R-30 minimum rigid insulation, and built-up asphalt roofing with a light-colored gravel surfacing. Exterior walls will be cavity type constructed of either 8" CMU or 6" metal stud backup, 4" air space with 2 1/2" rigid or spray foam insulation, and 4" face masonry veneer.
- Exterior veneer materials will complement the existing materials, including use of face brick with some header and soldier courses. Cast stone sills will likely be used for windows in lieu of header course brick as at the existing structure due to long term maintenance concerns.
- Thermally broken aluminum windows with 1" insulated glazing will be used to provide an abundance of natural daylight. Exterior doors and frames will be thermally broken aluminum at all public and student-use areas and painted insulated hollow metal at storage and service areas.
- New interior walls will primarily consist of light gauge metal studs with impact-resistant drywall. Concrete masonry units may be used for specific high-impact areas like entrances, corridors, gymnasium and cafetorium spaces, and at masonry bearing walls. Walls in most locations will be painted with low-VOC coatings. New restrooms will receive ceramic tile on the wet walls.
- New flooring will consist of vinyl composition tile at corridors. Entry vestibules will receive walk-off mats. Corridors and vestibules will receive a 4" to 6" high tile wall base. The classrooms will receive vinyl composition tile flooring and rubber wall base. New restrooms will have resinous flooring and base.
- Ceilings throughout will primarily be 2'x4' standard acoustical tile in prefinished steel grid, with some painted gypsum board bulkheads.
- New interior doors will be prefinished solid flush wood in painted hollow metal frames. All classroom doors shall have narrow vision lights to allow for increased supervision and visibility between the corridors and classrooms, while minimizing glazing to ensure security.
- All newly constructed and renovated areas of the facility will be ADA accessible.

SECTION 5 | PLANNING AND DESIGN CONSIDERATIONS

DESIGN AND CONSTRUCTION RECOMMENDATIONS

OPTIONS 1 AND 2 MODERNIZATION CONSIDERATIONS

- For Option 1, the existing gymnasium/cafetorium/administration wing shall receive a new built-up asphalt roofing system. This is the only area of the building that has not received a roof replacement within the past 5 years. At this area, the existing roofing system shall be removed down to the existing metal deck and a full new system to match that used at the new construction will be installed. Tapered insulation will be used to create slopes to drain where none currently exist.
- Depending upon the mechanical system selected, due to the very limited clear space between the underside of structure and existing ceilings, a linear penthouse may need to be created on the roof of the original classroom wing in order to provide space to route new ductwork and/or piping outside of the existing building envelope.
- Extensive repointing and repair of the exterior masonry veneer (brick and concrete panels) is anticipated. Approximately 35% of the existing brick veneer will need repointing. Note that there are severe mortar joint failures whose exact cause is unknown. Some destructive testing should be considered if a modernization project is pursued in order to determine the cause of and best methods for remediation of these failures. Reconstruction/replacement of a number of the existing steel lintels will also be required.
- All existing exterior windows and doors will be removed and replaced with new materials to match those used at the new construction. Exterior doors will no longer be provided from perimeter classrooms, only fixed windows will be provided. Exterior openings will be reworked to better align with the new perimeter classroom layout and at least one window will be provided per classroom.
- All interior demountable partition walls and metal stud framed partition walls will be removed. Interior CMU bearing walls supporting the steel roof structure will remain. See new construction recommendations for information regarding construction of new walls.
- The existing classroom door alcoves at the center wing will need to be widened to provide ADA maneuvering clearances at the doors. This will involve demolition and reconstruction of a portion of the existing walls.
- The existing interior cast-in-place concrete ramps will need to be demolished and repoured in order to decrease their slope to be no greater than 1:12 per ADA. This includes three ramps for Option 1 and two ramps for Option 2.
- In order to improve thermal performance, the interior face of all exterior walls to remain will be furred out with 3 5/8" metal studs or zee furring and will receive thermal batt or acoustical board insulation with a painted hi-impact gypsum board interior finish.
- All existing restrooms to remain will need to be reconfigured to meet ADA. This will involve a full removal and replacement of all fixtures, partitions, accessories, and finishes.
- All existing finishes, casework, display boards, etc. will be removed and replaced to match the types utilized for new construction.

SECTION 5 | PLANNING AND DESIGN CONSIDERATIONS

DESIGN AND CONSTRUCTION RECOMMENDATIONS

COMMON SITE DESIGN ELEMENTS FOR ALL OPTIONS

- New public water will need to be extended from across Jefferson Pike.
- The entire site area will be reworked to improve site circulation.
- Parking will be expanded to accommodate at least 120 cars and the bus loop will be expanded and reconfigured to hold at least 10 buses.
- Three new paved play areas and three new soft surface play areas will be provided.
- A soccer field and flag football field will be provided.
- Stormwater management will be required to meet Environmental Site Design regulations, which will include strategies such as bioretention and infiltration.
- It is anticipated that approximately 4.75 acres of reforestation will be required. This could be provided on-site or as fee-in-lieu.

COMPLIANCE WITH ENVIRONMENTAL REGULATIONS

The proposed improvements do not appear to be located within a designated wetland, navigable waterway, and are outside the 100-year floodplain boundary area (as defined by FEMA). Compliance with The Maryland Department of the Environment's Wetlands and Waterways Program is not required. Site disturbance greater than 40,000 square feet is subject to the Maryland Forest Conservation Act and will require a Forest Stand Delineation and a Forest Conservation Plan. Submission requirements are referenced in The State of Maryland State Forest Conservation Technical Manual (Third Edition, 1997). An Erosion and Sediment Control Plan designed in accordance with the Code of Maryland Regulations, the 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control, and the Stormwater Management Act of 2007 must be submitted to Frederick County, approved and implemented in advance of any site disturbance.

The existing building contains limited quantities of hazardous materials. Prior to any demolition or modernization work, the existing building should be fully assessed and abated of all ACM and lead paint hazards. Abatement requirements and approval are handled through the Maryland Department of the Environment (MDE).

SECTION 5 | PLANNING AND DESIGN CONSIDERATIONS

LOCAL PLANNING INITIATIVES

The existing school site is not identified as a resource site in the June 2017 Frederick County Land Preservation, Parks and Recreation Plan (https://www.frederickcountymd.gov/DocumentCenter/View/296485/Frederick-Co-LPPRP_Map_June-2017?bidId=).

Additionally, according to the April 2010 (with September 2012 amendments) Frederick County Maryland Comprehensive Plan map (https://maps.frederickcountymd.gov/GISPublicDownload/MapAtlas/CountywideMaps/CompPlan_34x44.pdf), the existing school site is not located within an Agricultural and Rural Community or Green Infrastructure boundary area.

HISTORICAL SIGNIFICANCE OF THE EXISTING BUILDING

A review of the Maryland Historical Trust, National Register of Historic Places and the Frederick County Register of Historic Places databases indicates that the site is not located within any historic districts or preservation easements and the existing building is not listed on the national register.

PROPOSED PROJECT SCHEDULE

The proposed project is one of two feasibility studies taking place in Spring 2021. The Board of Education will evaluate the results of the two studies and determine which project is a higher priority. The two projects are scheduled to have a staggered start and completion one year apart, subject to the availability of funding.

Design would begin in FY23 or FY24, construction would begin in FY24 or FY25, and the schools would open in the fall of 2025 or 2026. This schedule assumes a construction time frame of 24 months or less, so if an option with a longer construction duration is chosen the opening date could be delayed. Two placeholder elementary school projects are shown in the out years of the County FY21 Approved Capital Improvement Program and would likely be used for these projects.



SECTION 6:

CONCEPT OPTIONS

- Option 1 | Modernization
- Option 2 | Modernization and Additions
- Option 3 | Replacement School On-Site

SECTION 6 | CONCEPT OPTIONS

OPTION 1 | MODERNIZATION | DESCRIPTION

Option 1 includes a complete modernization of the existing facility to remain without construction of any new space. The goal in developing this option is to modernize the existing facility by providing up-to-date systems, technology, and finishes.

In this option the existing interior spaces will be modernized like the plan for the modernization of the existing building in Option 2. Permanent walls and a corridor system will be installed in the 1973 classroom addition and in the center of the original classroom wing to separate classrooms and support spaces and improve circulation. Smaller support spaces will take the place of some of the existing undersized classrooms within each wing, therefore the total number of typical classrooms upon completion of the project will decrease from 22 to 18. Only 2 kindergarten classrooms will be provided. Core spaces will not be expanded and only one Music room and one Art room will be accommodated within the building. Site modifications will include provision of public water, expansion of play areas, and accessibility upgrades as required by Code.

The existing structure will remain intact, with minor upgrades for installation of new mechanical units on the roof as required. Existing mechanical, electrical, and plumbing systems will be replaced almost in their entirety, except for select components that have been recently upgraded if determined feasible to remain. A new sprinkler system will be installed. All existing interior fixtures and finishes will be removed and replaced with new. This includes all new casework, cubbies, display boards, plumbing fixtures, etc. The existing terrazzo flooring and structural glazed facing tile in the corridors are in good condition and can remain. Classrooms will receive new VCT flooring, new paint, and new acoustical tile ceilings. See Section 5 for additional design and construction recommendations.

In this option, construction phasing is proposed as follows (note that some phases overlap):

- Phase 1 (First summer) – Renovate existing gymnasium, cafetorium, and kitchen
- Phase 2 (Year one - First summer to second summer) – Renovate 1973 classroom wing
- Phase 3 (Second summer) – Renovate existing administration area, work on site improvements
- Phase 4 (Year two - Second summer to third summer) – Renovate original classroom wing and media center
- Phase 5 (Third summer) – Complete remainder of site upgrades

An additional 12 or more relocatable classrooms will be required to be installed on site and to remain for the duration of construction in order to allow each phased area to be vacated for one school year during its renovation.

This option does not have enough space available within the existing building to accommodate all of the Educational Specification requirements. 16 relocatable classrooms will be required to remain on site after completion of construction in order to provide adequate classroom space and support spaces for 705 students.

Estimated base bid construction costs: \$23,893,747 (costs do not include escalation, construction management fees, or construction contingency).

Estimated construction duration: 24-28 months, including all associated sitework.

SECTION 6 | CONCEPT OPTIONS

OPTION 1 | MODERNIZATION - CHALLENGES & OPPORTUNITIES COMPARISON

OPPORTUNITIES

- Minimal disruption to the existing site.

CHALLENGES

- Phasing and temporary facilities will be required.
- 16 portable classrooms will be required after completion to meet capacity of 705.
- Core spaces are significantly undersized.
- Portions of the building are at different finished floor elevations – added cost for renovations required to create an ADA compliant ramp.
- Car stacking space is limited in the drop-off loop due to site constraints.
- The Media Center and many support spaces do not have access to daylight or views to the exterior.
- The Add Alternate spaces cannot be provided within the existing building footprint.
- Limited ceiling space for MEP systems and potential unforeseen envelope conditions will make modernization challenging.
- Construction activities will be disruptive to students and staff.



SECTION 6 | CONCEPT OPTIONS

OPTION 2 | MODERNIZATION AND ADDITIONS | DESCRIPTION

Option 2 includes a complete modernization of the existing facility to remain along with demolition of the existing Gymnasium/Cafetorium/Kitchen wing and construction of a large addition in order to create additional program space to serve the new capacity. The goals in developing this option were to modernize the existing facility by providing up-to-date systems, technology, and finishes and to add onto an existing circulation path and retain daylight to all classrooms.

In this option the existing interior spaces and functions are modified and reconfigured in order to correct programmatic deficiencies and improve adjacencies. The existing wing containing the gymnasium, cafetorium, and support spaces will be demolished. A new addition with a looped corridor will wrap the north and west sides of the existing building. A courtyard will be created between the existing building and the addition. The addition will include a new main entrance and admin area, replacement gymnasium, cafeteria, food service area, music classrooms, kindergarten classrooms, support services rooms, and restrooms on its lower level. A partial second floor will contain typical classrooms, support spaces, and restrooms.

Site modifications will include full alteration and expansion of the bus loop, parking areas, drop-off, and loading areas. The existing access points along Horine Road and Jefferson Pike will be maintained. Buses and loading traffic will use the Jefferson Pike entrance. The bus loop will also contain parking that can be used for events in the gym or with the Parks & Rec facility if constructed. New paved and soft surface play areas will be provided to the east and south of the addition and new multi-use athletic fields can be provided to the east of the new play areas.

See the Option 1 narrative for proposed upgrades to the existing facility systems and finishes. This Option does include demolition of select interior partitions at the existing building and construction of new partitions. The existing demountable partitions in the 1973 addition will be removed and replaced with permanent light gauge stud walls.

In this option, construction phasing is proposed as follows (note that some phases overlap):

- Phase 1 (First summer) – Relocate administration suite to existing kindergarten classrooms in 1973 addition, relocate kindergarten to typical classrooms within existing building and provide 2 relocatable classrooms for typical classrooms. Construct new bus loop and parking to east.
- Phase 2 (Year one - First summer to second summer) – Construct new gym/cafetorium addition.
- Phase 3 (Second summer) – Demolish existing gym/cafetorium wing, begin to construct new drop-off loop and parking to west of addition.
- Phase 4 (Year two - Second summer to third summer) – Construct classroom addition, complete drop-off loop and parking to west of addition.
- Phase 5 (Third summer) – Move into new classroom addition, place additional relocatable classrooms for modernization work.
- Phase 6 (Year three - Third summer to fourth summer) – Renovate existing building to remain.
- Phase 7 (Fourth summer) – Complete remainder of sitework.

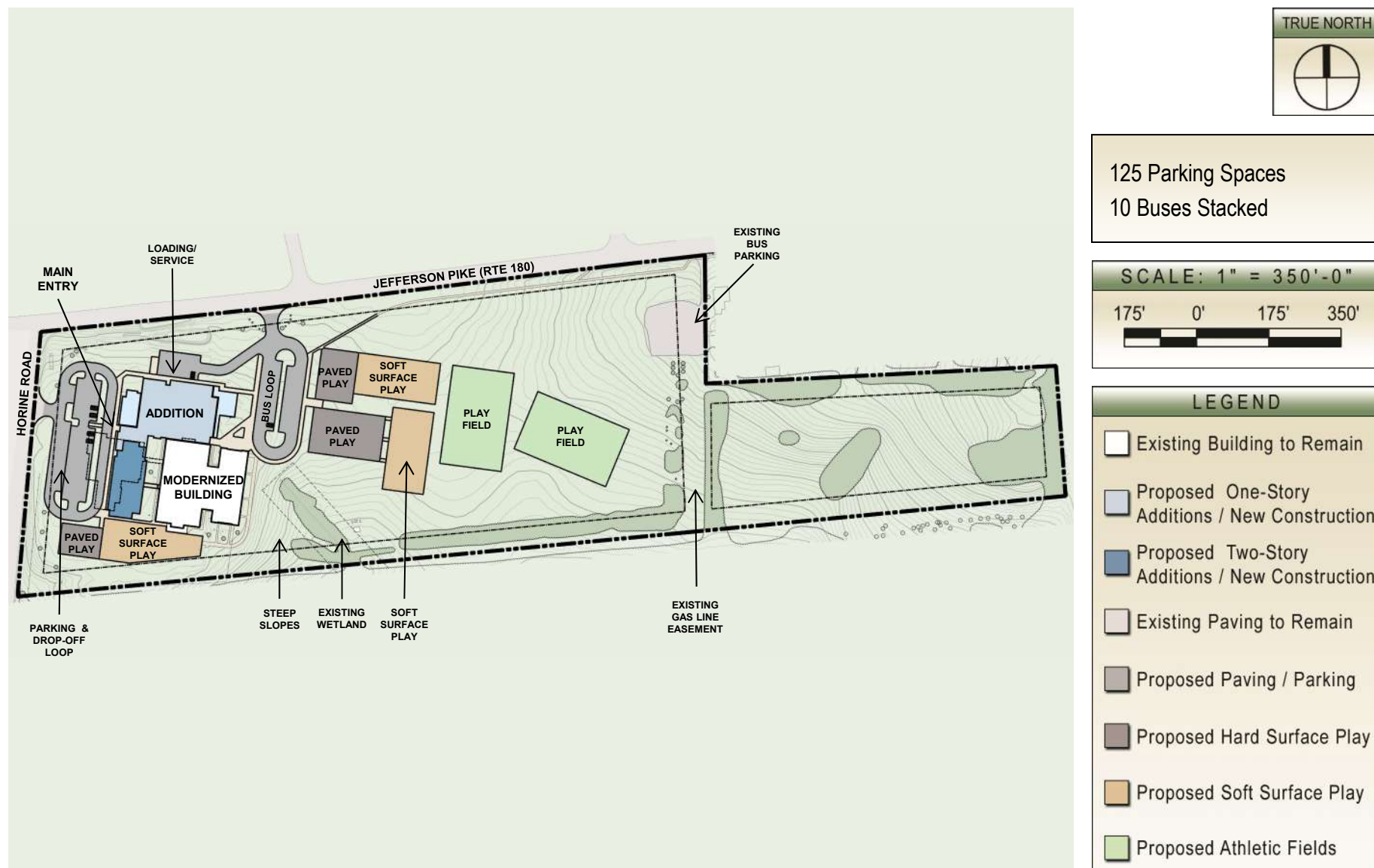
The addition housing the new assembly spaces (gym/cafetorium/music) will be constructed first. Once the gym/cafetorium/music areas are ready to occupy, then demolition of the existing assembly spaces can begin. After the demolition is complete, then the classroom addition construction will start. When the classroom addition is completed, those spaces can be occupied and then renovation of the existing building will begin. Up to eight relocatable classrooms may be required to be placed on site during the existing building renovations depending on enrollment at the time.

Estimated base bid construction costs: \$45,583,205 (costs do not include escalation, construction management fees, or construction contingency).

Estimated construction duration: 36-38 months, including all associated sitework.

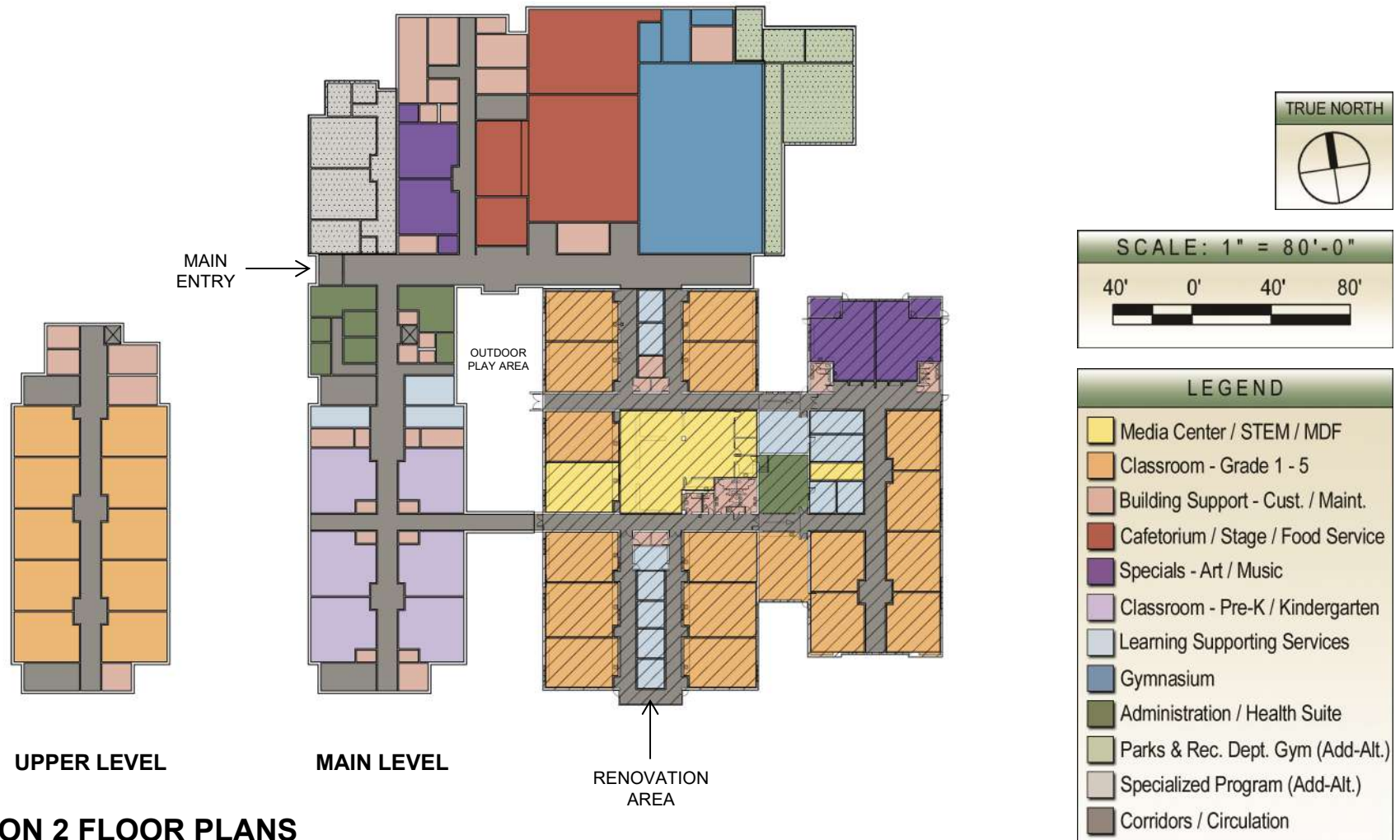
SECTION 6 | CONCEPT OPTIONS

OPTION 2 SITE PLAN



SECTION 6 | CONCEPT OPTIONS

OPTION 2 | MODERNIZATION AND ADDITIONS



OPTION 2 FLOOR PLANS

SECTION 6 | CONCEPT OPTIONS

OPTION 2 | MODERNIZATION AND ADDITIONS - CHALLENGES & OPPORTUNITIES COMPARISON

OPPORTUNITIES

- All Educational Specification requirements can be accommodated while retaining a portion of the existing facility.
- Good separation of buses, cars, and building services/loading.

CHALLENGES

- Phasing and temporary facilities will be required.
- Depending on the final design a courtyard may be desirable to provide daylight and views but could be a maintenance concern.
- The Media Center and many support spaces do not have access to daylight or views to the exterior.
- Portions of the building are at different finished floor elevations – added cost for renovations required to create an ADA compliant ramp. .
- Limited ceiling space for MEP systems and potential unforeseen envelope conditions will make modernization challenging.
- Construction activities will be disruptive to students and staff.



SECTION 6 | CONCEPT OPTIONS

OPTION 3 | REPLACEMENT ON-SITE | DESCRIPTION

Option 3 includes construction of a new structure to the east of the existing building and demolition of the existing structure. The goal of this option is to provide a fully new, modern, and energy-efficient facility that meets the required programming with minimal impact on the existing building during construction.

This option is based on the current elementary prototype being used for Blue Heron Elementary School. The topography where the building is to be placed is relatively level, so instead of constructing a portion of the classroom wing at a lower level like at Blue Heron, the main entrance will occur at grade level at the front of the building and an upper floor will be constructed over the main level at the rear classroom wing. The northern portion of the main level contains the administrative suite, cafetorium, gymnasium, art, music classrooms, and support spaces. The eastern portion of the building contains classroom wings and the media center at the main level and classrooms at the upper level.

Site improvements include a new pick-up/drop-off loop and parking area that will be located to the north of the building, facing Jefferson Pike. This entrance will also provide access for the service drive and loading area. The new bus loop entrance is located just slightly to the east of the existing entrance, shifted to align with the existing cross-street. The bus loop contains additional parking for staff or visitors. All vehicular circulation provides access at the main level of the building, adjacent to the administrative suite. Pre-K and kindergarten play areas are to be located to the south of the building, adjacent to those classrooms. While the building pad area is fairly level, the area to the east where the primary and intermediate play areas and fields are to be located contains steep slopes. Extensive earthwork and/or retaining walls are anticipated to be required in order to create functional and accessible amenities. New paved and soft surface play areas are proposed to be located adjacent to the gym and cafeteria. Multi-use athletic fields can be provided to the east of the new school and also potentially at the southwest corner of the site after demolition of the existing building occurs. The existing bus parking lot at the northeast corner of the site will need to be relocated.

In this option, construction phasing is proposed as follows:

- Phase 1 (Year one to start of year two - First spring to second fall) – Construct the new building, new bus loop, and majority of new parking. Note that up to 18 months may be required for construction of the building, so if occupancy is desired in September, then construction may need to begin in February or March.
- Phase 2 (Remainder of year two to start of year three – Second fall to third summer/fall) – Demolish the existing building and existing site amenities and restore west area of the site.

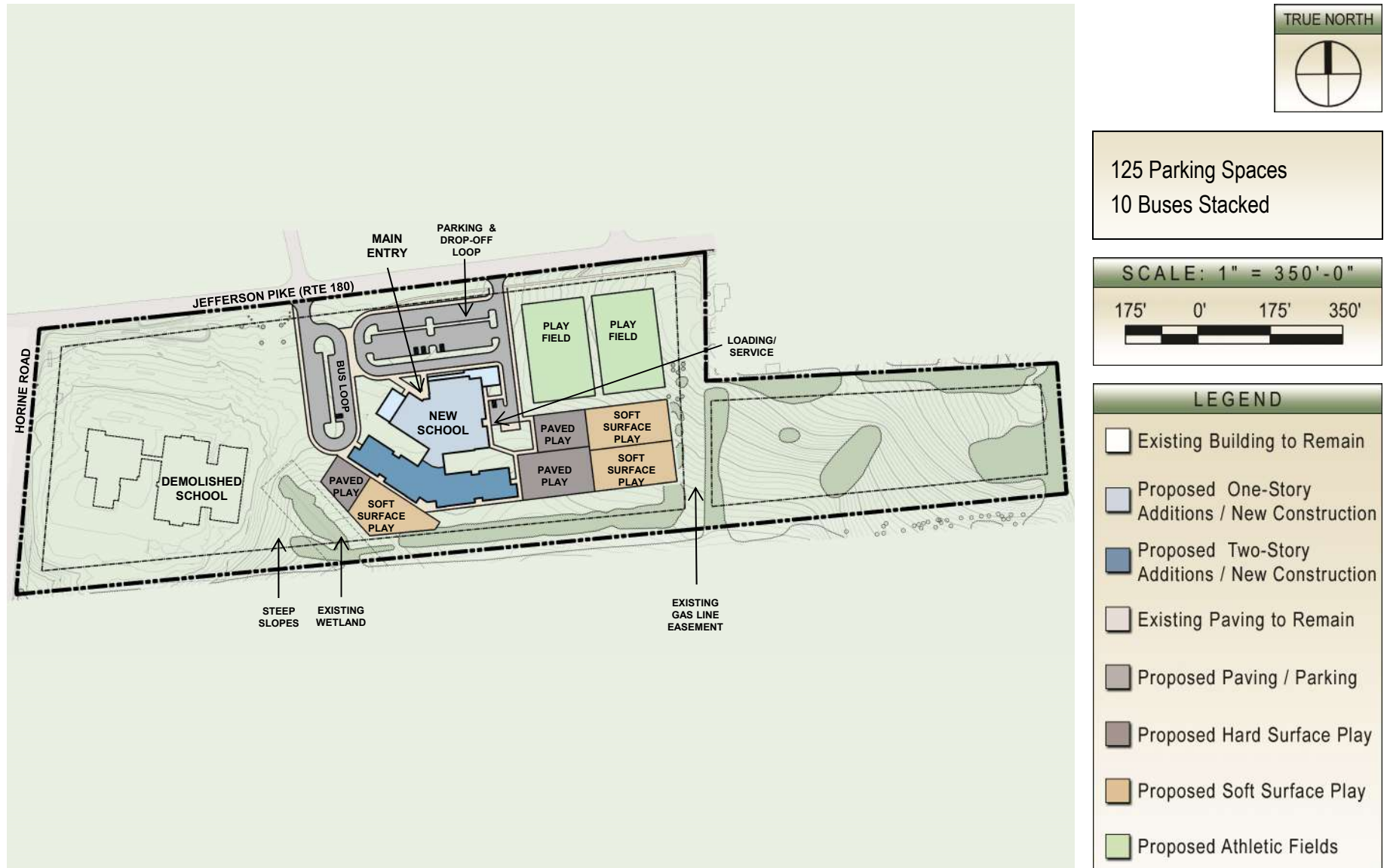
Once the new building is constructed, students can move from the existing building into the new building so that the existing building can be demolished.

Estimated base bid construction costs: \$43,813,018 (costs do not include escalation, construction management fees, or construction contingency).

Estimated construction duration: 24-28 months (16-18 months for construction of new building, plus 8 to 12 months to complete demolition and sitework)

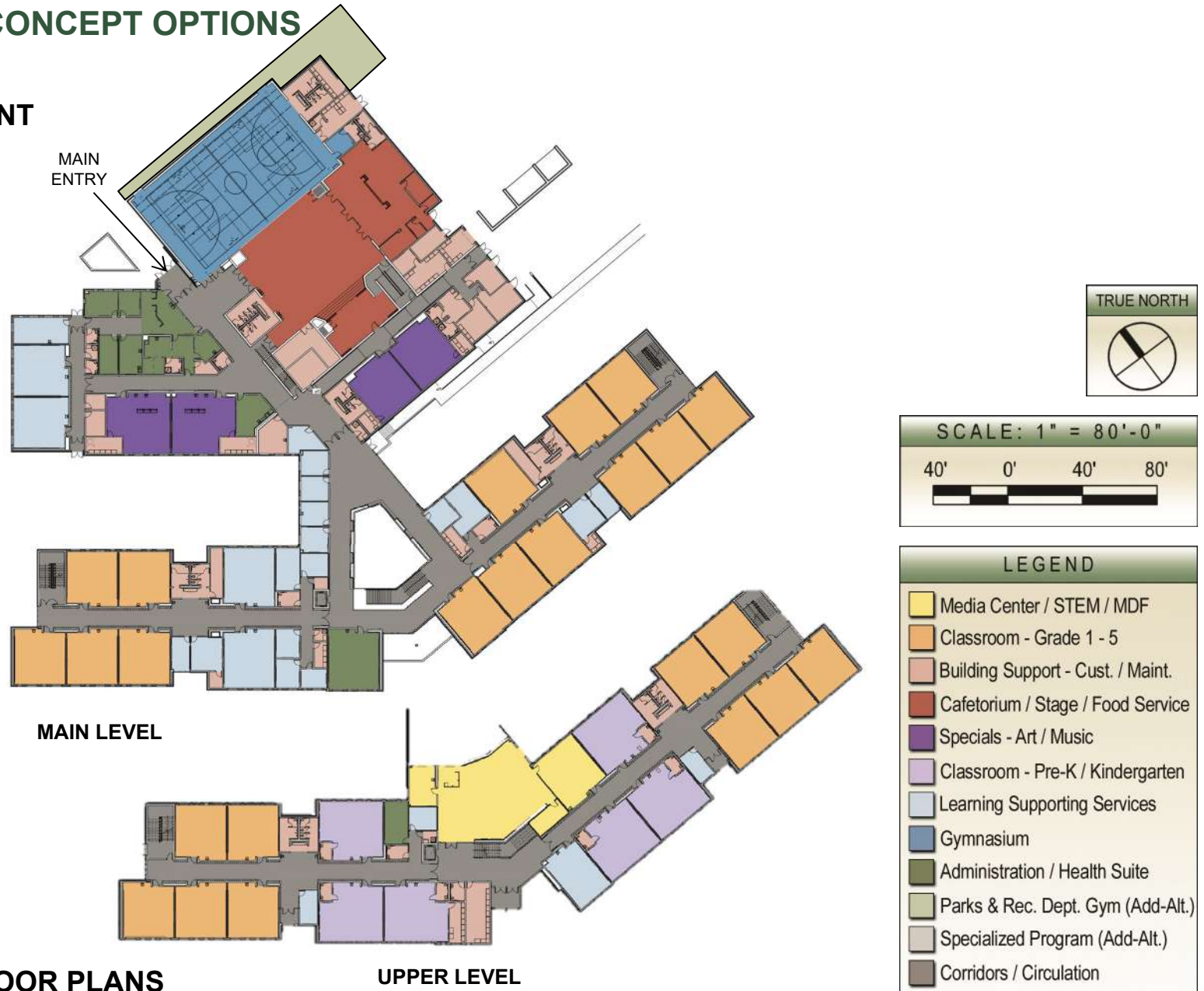
SECTION 6 | CONCEPT OPTIONS

OPTION 3 SITE PLAN



SECTION 6 | CONCEPT OPTIONS

OPTION 3 | REPLACEMENT ON-SITE



OPTION 3 FLOOR PLANS

UPPER LEVEL

SECTION 6 | CONCEPT OPTIONS

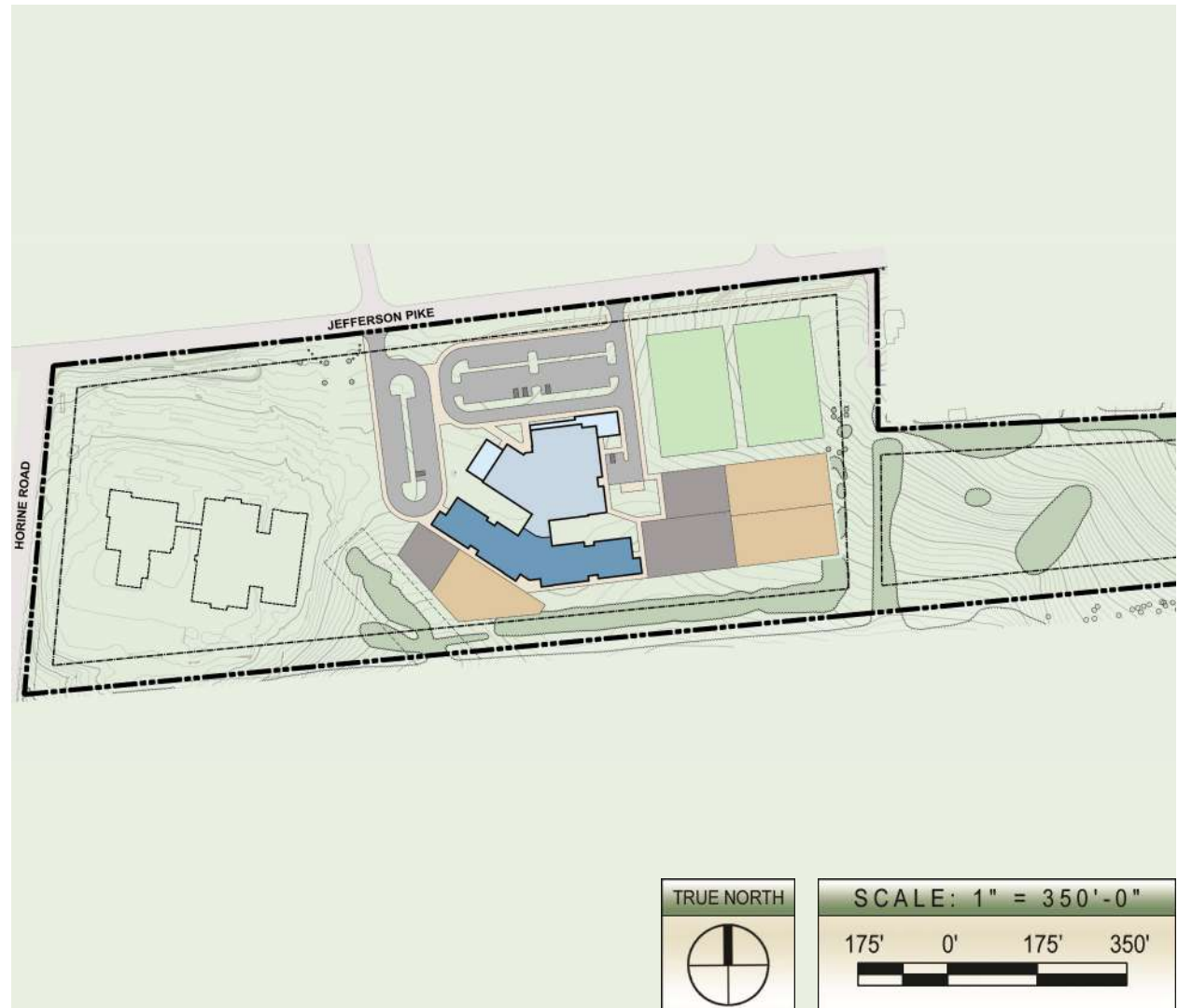
OPTION 3 | REPLACEMENT ON-SITE - CHALLENGES & OPPORTUNITIES COMPARISON

OPPORTUNITIES

- Classroom layouts cluster well for grade level grouping.
- All regularly occupied spaces will have access to daylight and views.
- Temporary facilities are not required during construction.
- Good separation of buses, cars, and building services/loading.

CHALLENGES

- Earthwork and possibly retaining walls will be required to construct the play areas and fields to the east of the new building.
- The existing bus parking area will need to be relocated to another area of the site.



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SECTION 7:

COST COMPARISON

- Summary of Estimated Costs
- Life Cycle Cost Analysis

SECTION 7 | SUMMARY OF ESTIMATED COSTS & LIFE CYCLE COST ANALYSIS

COST ESTIMATE

Construction and Project Costs									
	Option 1			Option 2			Option 3		
	GSF	\$/SF or %	Total	GSF	\$/SF or %	Total	GSF	\$/SF or %	Total
Construction Costs									
Total Proposed Building Area	55,783			93,856			84,210		
Hazardous Materials Abatement	55,783	15.33	855,321	55,783	15.33	855,321	55,783	15.33	855,321
Selective Building Demolition	55,783	12.38	690,616	37,534	12.38	464,686	0	0	-
Whole Building Demolition	177	7.64	1,352	18,943	7.64	144,687	56,633	7.64	432,563
New Construction	0	0	-	56,322	327.58	18,449,961	84,210	307.11	25,861,733
Modernization	55,783	226.53	12,636,523	37,534	226.53	8,502,577	0	0	-
Subtotal Building Costs			14,183,812			28,417,231			27,149,617
Site Demolition			266,760			565,440			775,234
Site Construction		23.0%	3,262,277		18.1%	5,143,519		25.5%	6,923,152
Subtotal Building and Site Costs		317.53	17,712,848		363.60	34,126,190		413.82	34,848,003
Phasing & Temporary Facilities Costs		2.0%	354,257		1.0%	341,262		0.3%	104,544
Subtotal Building, Site, & Phasing Costs		323.88	18,067,105		367.24	34,467,452		415.06	34,952,547
Design Contingency		15%	2,710,066		15%	5,170,118		15%	5,242,882
Subtotal Construction Costs		372.46	20,777,171		422.32	39,637,570		477.32	40,195,429
Construction Management		9%	1,869,945		9%	3,567,381		6%	2,411,726
Construction Contingency		6%	1,246,630		6%	2,378,254		3%	1,205,863
Total Construction Costs (current dollars)		428.33	23,893,747		485.67	45,583,205		520.28	43,813,018
Additional Project Costs									
Furniture and Equipment			1,250,000			2,000,000			2,000,000
Testing & Inspections, Permitting Fees			450,000			550,000			550,000
Project Planning Costs		8%	1,662,174		7%	2,774,630		5%	2,009,771
Subtotal Project Costs			3,362,174			5,324,630			4,559,771
Total Construction and Project Costs			27,255,920			50,907,835			48,372,789

Note: Costs outlined above are for the base bid scope of work only. If accepted, the Parks and Recreation Add Alternate is expected to add approximately \$1,390,000 to the construction cost. If accepted, the Alternative Specialized Program Add Alternate is expected to add approximately \$1,295,000 to the construction cost. These estimates do not include construction management fees or construction contingency.

SECTION 7 | SUMMARY OF ESTIMATED COSTS & LIFE CYCLE COST ANALYSIS

MECHANICAL SYSTEM 40-YEAR LIFE CYCLE COST ANALYSIS

The annual energy cost was developed utilizing computer modeling based on a Variable Refrigerant Volume (VRV) system used in conjunction with direct expansion cooling natural gas heating Dedicated Outdoor Air System (DOAS) units utilizing heat recovery. Assembly spaces were modeled using Direct Expansion, gas heat single zone Variable Flow Heat Recovery Air Handling Units.

40-Year Life Cycle Cost Analysis			
	Option 1	Option 2	Option 3
Initial Construction Cost	27,255,920	50,907,835	48,372,789
Total Building SF	55,783	93,856	84,210
Mechanical System Installation Cost			
Mechanical System Replacement Cost	3,220,000	5,420,000	4,855,000
Operating Costs			
Annual Operating Cost (\$)	47,608	90,817	83,604
Annual Maintenance Cost (\$)	22,313	37,542	33,684
Total Annual O&M cost	69,921	128,359	117,288
Period (Years)	40	40	40
Assumed Operating Escalation Cost	4%	4%	4%
Assumed Annual Discount Rate	3.5%	3.5%	3.5%
Present Value of O&M Cost (44.22) (\$)	3,091,907	5,676,035	5,186,475
40-Year Life Cycle Cost - Total (\$)	33,567,827	62,003,870	58,414,265
40-Year Life Cycle Cost - per SF (\$)	601.76	660.63	693.67

Notes

1. Present value of O&M expense equals total annual O&M cost multiplied by PW factor.
2. Maintenance cost is based on \$0.40 per GSF for an air cooled VRV system.
3. 40-year life cycle cost equals initial construction cost plus present value of O&M expense over 40 years.

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SECTION 8:

APPENDICES

- Appendix A: Consultant Recommendations

APPENDIX A | CONSULTANT RECOMMENDATIONS

FOOD SERVICE DESIGN RECOMMENDATIONS

Options 2 and 3 will receive a new, enlarged kitchen with all new equipment.

- The facility will be equipped with all-new commercial-grade appliances meeting current N.S.F. requirements and installed in compliance with local governing health codes. All countertops and work surfaces will be of durable stainless steel finishes and mounted on legs to promote sanitation and ease of cleaning.
- The kitchen will be designed to operate as an on-site prep/production facility equipped to produce and serve breakfast and lunch meals to the students and staff. Bulk refrigerated items will be stored in reach-in refrigerators & freezers. Onsite cooking will take place in convection oven, combi oven and steamer requiring a non-grease exhaust canopy. A fire protection system with this style of ventilation is not required. Trays and utensils will be washed and sanitized through a high-temperature dish machine. Clean ware will be stored on mobile pot & pan shelving.
- Serving of students will take place on modular cafeteria counters equipped with 5-well steam table for hot food, mechanically-refrigerated frost top for cold food, ice cream cabinet, solid top counter for cutlery and snack items and a bulk milk cooler for milk and beverages. Meals will be served on re-useable trays.

APPENDIX A | CONSULTANT RECOMMENDATIONS

STRUCTURAL RECOMMENDATIONS

Structural Options Narrative

1. Renovation Option:
 - 1.1 The school will be partially demolished, specifically the core wing (built in 1967 and expanded in 1973) composed of administrative offices, kitchen, cafetorium/auditorium with stage and mechanical rooms.
 - 1.2 The structure to remain will be the original 1967 classroom wing (which includes the current media center) and the attached 1973 classroom wing. A moderate amount of structural repairs are anticipated as follows:
 - 1.2.1 Exterior walls of 1967 classroom wing: *Expose steel lintels and beams and remove all rust, repaint or replace steel beams and lintels; rebuild the CMU and brick at jambs and above window openings.*
 - 1.2.2 SW exterior corner of 1967 classroom wing: *Demolish the wall in this corner to the foundation level, verify quality of soil bearing and demolish footing if soil needs to be recompacted, then rebuild foundation and wall in this corner.*
 - 1.2.3 Exterior walls of 1973 classroom wing: *Remove (4) W18 lintels and rebuild a new CMU lintel over these windows; rebuild CMU and brick at jambs and above window openings.*
 - 1.3 The new One-Story Addition will be comprised of administration spaces, gymnasium, and cafetorium. The new structure will primarily be steel framed with some load bearing masonry for the gymnasium and all-purpose room. See Replacement Option on the following page for additional framing information.
 - 1.4 The new Two-Story Addition will be for classrooms. See Replacement Option on the following page for additional framing information.

APPENDIX A | CONSULTANT RECOMMENDATIONS

STRUCTURAL RECOMMENDATIONS (Continued)

2. Replacement Option:

- 2.1 The proposed building will be located to the east of the existing building. The existing structure will be completely demolished. The footprints of the existing and new buildings will not overlap; the existing structure will NOT need to be vacated during construction of the replacement building.
- 2.2 The new school will have a similar footprint to the Blue Heron prototype elementary school with two-story area for classrooms and one-story section comprised of administration spaces, gymnasium, all purpose room, and specials. The new structure will primarily be steel framed with some load bearing masonry for the gymnasium and all-purpose room.
- The roof framing would consist of 1.5-inch metal roof deck supported by steel joists at 5'-0" on center and wide-flange steel girders or masonry bearing walls. The roof of the Gym and Cafetorium will be framed with long span open web steel joists to provide a column free interior space. Acoustic deck will be used at the exposed structure areas.
- 2.3 The upper level floor structure would consist of 5" composite concrete slab and deck on wide-flange beams spaced 6 to 8 ft. on center and wide-flange girders. The structure would be supported by steel columns on spread column footings.
- 2.4 Twelve-inch masonry walls will be required for the high roof spaces of the gymnasium and all-purpose room, and eight-inch masonry will be required for the shorter bearing walls. If masonry fire walls are required to provide separation of structure eight-inch masonry will be used and coordinated to meet code requirements. Eight-inch masonry or six-inch metal stud walls will be required for the backup wall structure in the exterior walls. Masonry partitions on the second floor will produce larger beam sizes. Metal stud partitions with impact resistant drywall will provide shallower beams and lighter steel framing.
- 2.5 Ground floors will consist of a 5" concrete slab on grade reinforced with welded wire reinforcing on vapor barrier over granular fill.
- 2.6 The foundation system for the addition is anticipated to be individual spread column footings and continuous wall footings, consistent with the existing construction. However, this will be confirmed by the findings of the geotechnical investigation.
- 2.7 Lateral system of the structure would be exterior CMU walls along with stair and elevator walls will be used as shear walls. If additional lateral resists capacity is required either interior steel moment or braced frames will provide addition load capacity to the CMU shear walls.

APPENDIX A | CONSULTANT RECOMMENDATIONS

MECHANICAL, ELECTRICAL, AND PLUMBING RECOMMENDATIONS

I. MECHANICAL SYSTEM RECOMMENDATIONS

A. RENOVATION/ADDITION OPTIONS

1. General: The existing heating plant and cooling plant are in good condition however the existing cooling plant is older than the existing heating plant. The existing heating and cooling plant does not have sufficient capacity to support significant additions.

There is a lack of infrastructure space for new piping and air distribution systems plus the recommended sprinkler system which will be challenging unless the existing system and equipment are replaced in kind which is not recommended.

2. HVAC Systems

- a. Central heating and cooling plants: One option is to create a new central plant in the area of the addition while phasing the old central plant out and/or to reuse the existing mechanical equipment room to serve the gym, cafetorium and office admin areas while replacing the cooling equipment with direct expansion type to allow for non-educational period use of the spaces.

Another option is to reuse the existing boilers and/or chillers, re-pipe and replace the pumps for variable flow and for the central plant to serve recirculating heating and cooling only units. The use of roof mounted Dedicated Outdoor Air Units (DOAS) can be packaged air cooled and gas fired heating units to provide the additional cooling and heating requirements without increasing the existing plant capacity.

Lastly, the existing water cooled chiller which is nearing the end of its useful life and uses refrigerant R-22 can be replaced with an air cooled chiller which will create additional space within the boiler room for supplemental boilers and pumps.

Other options include utilizing a geothermal system and or Variable Refrigerant Volume (VRV) system and reusing the existing boilers to provide heating in lieu of gas fired furnaces for DOAS and Air Handling units.

- b. Terminal Units: One option which reuses the existing boilers and/or chiller is a 4-pipe Fan Coil Unit system utilizing Dedicated Outdoor Air System (100% outside air DOAS units). Conditioned outside air for ventilation would be introduced into each space via an air distribution system from the dedicated outdoor air system (DOAS) air handling unit. An air cooled chiller and gas fired condensing boilers (existing or new) are recommended for the central cooling and heating plant. Each space would then be heated and cooled by a 4-pipe recirculating fan coil unit served by the central heating and cooling plant. Fan Coil Units can be the ducted vertical type where they would be located within a mechanical closet (approximately 5' x 6') within each classroom or be the horizontal low profile ducted type located above the ceilings similar to the existing horizontal Unit Ventilators. All DOAS and FCU ductwork will have to be strategically designed in conjunction with the chilled water and heating water piping systems based on the limited ceiling space (18" minimum needed). This can create conditions with lower ceilings than existing and or numerous bulkheads throughout the building.

APPENDIX A | CONSULTANT RECOMMENDATIONS

MECHANICAL, ELECTRICAL, AND PLUMBING RECOMMENDATIONS (Continued)

MECHANICAL SYSTEM RECOMMENDATIONS (Continued)

A water source heat pump system using a condenser water loop be it using boilers and cooling tower, a geothermal system or hybrid geothermal option is similar to the fan coil unit option except an earth heat exchanger is used in lieu of boilers and chillers. A hybrid approach is to provide supplemental boilers and cooling towers or use independent systems for the gym, cafeteria, and office admin suite. Water to air heat pumps are physically much larger than Fan Coil Units and are not recommended to be located above classroom ceilings.

A non-hydronic option is a refrigeration based fan coil unit system known as a variable refrigerant volume (VRV) system. Multiple indoor ceiling type Ductless cassette units would be piped to a common refrigeration piping system to an outdoor air cooled heat pump unit. The DOAS unit will also be direct expansion (DX) based via packaged rooftop units with natural gas furnaces.

For assembly spaces (cafetorium, gymnasium), single zone variable flow air handling units are recommended. These units in both fan coil type system options are recommended to be direct expansion type with natural gas furnaces such that the spaces are independent from the building system and can be used at night and / or on weekends.

Similarly, in all fan coil unit options, it is recommended that the office / admin suite be an independent VRV with DOAS system.

3. Plumbing

- a. Domestic Water: A new 6" or 8" public water service is recommended to serve the domestic water and fire protection system requirements.

The existing water heaters can be reused. All domestic water piping is recommended to be replaced in its entirety to meet current State of Maryland lead free law and code required hot water tempering requirements.

Sanitary: It is recommended that the existing underground sanitary lines be videotaped to determine the condition for possible reuse or be replaced in part or in their entirety.

Storm Water: It is recommended that the existing underground storm water lines be videotaped to determine the condition for possible reuse or be replaced in part or in their entirety. A secondary overflow roof drainage system is recommended to meet current code requirements.

Fire Protection: It is recommended the building be protected by a wet pipe sprinkler system.

APPENDIX A | CONSULTANT RECOMMENDATIONS

MECHANICAL, ELECTRICAL, AND PLUMBING RECOMMENDATIONS (Continued)

B. NEW BUILDING OPTION:

1. General

The Mechanical Systems will include all work associated within the building of Heating, Ventilating, Air Conditioning (HVAC), and Plumbing Systems. These systems will extend to 5 feet beyond the building wall.

The Mechanical Systems, in concert with the Architectural considerations, are intended to create spaces that are flexible, functional, energy efficient, and respond to the needs of this facility.

Within the envelope of the new facility, the proper heating, cooling, ventilation, air exchanges, and Automatic Temperature Control/Energy Management Systems will be provided for all spaces to create the appropriate thermal environment. Stairwells will be provided with heat only. All other areas will be provided with heating, ventilation, and air conditioning. The HVAC and related Mechanical Systems will not only be functional and responsive to the need, but will be simple, reliable, durable, maintainable, and easily accessible. The HVAC System utilizes energy conservation techniques to the greatest extent possible, while maintaining comfortable control. All HVAC components will be capable of a complete override from the Energy Management System.

Heating and Cooling Systems and their associated controls are designed and zoned to enable the building to operate at less than full occupancy without conditioning the entire building.

The Mechanical Systems, including Fire Protection, will be designed in accordance with ASHRAE Standards, International Building Codes, NFPA, the International Plumbing Code, Frederick County Code Requirements, IAC Standards and LEED v4. The proposed HVAC Systems to be analyzed during the Design Development phase will include 2 systems, Variable Air Volume and Fan Coil Units utilizing a four-pipe Central Plant Heating/Cooling System and 2 decentralized heat pump systems, Water Source Heat Pumps utilizing a two-pipe condenser water loop, and air source heat pump, refrigerant based, Variable Refrigerant Volume/Flow (VRV/VRF) system.

Commonalities include the Variable Air Volume System and Fan Coil Unit System will both utilize a boiler type heating plant and chiller type cooling plant, while the fan coil unit system, water source heat pump system, and variable refrigerant volume (VRV) systems all require a Dedicated Outdoor Air System (DOAS). VAV and FCU systems are considered central type since the heating and cooling plants serve the entire building. A WSHP is more decentralized, whereas the VRV system is the most decentralized and independent of equipment serving other areas within the building. Although all four (4) systems have similarities, each is uniquely different.

The Office/Administration Area, which functions twelve (12) months a year will be zoned such that it can operate independently from the rest of the school. All other areas will be separately zoned based on use and function.

APPENDIX A | CONSULTANT RECOMMENDATIONS

MECHANICAL, ELECTRICAL, AND PLUMBING RECOMMENDATIONS (Continued)

2. Summary of HVAC System Options:

Variable Air Volume: Variable Air Volume systems are considered an all air system, which will utilize a central hot water heating plant and chilled water cooling plant to provide the necessary heating and cooling capacity for the building. Chiller capacity, boiler capacity, and all central plant equipment vary in size requirements based on building area and associated capacity requirements. 4-pipe VAV systems offer an energy efficient system at a relatively lower cost compared to other systems. Central air handling units are sized to distribute all heating and cooling capacity to spaces served by an air distribution system. Air handling unit and ductwork size (i.e. space requirements will vary based on the amount of area served).

Fan Coil Units: Similar to a VAV system, a Fan Coil Unit system will utilize a central heating and cooling plant. It is considered a water to air decentralized system. Energy is distributed through water piping to the fan-coil unit serving each space, so there is more piping, coils, and units throughout the building with less over all ductwork than an all air system.

It is considered decentralized since typically individual fan coil units serve a space and failure of a fan coil unit does not affect other spaces. A fan coil unit is merely a unit with a fan, heating and cooling coils, and a filter. Heating and cooling capacity is generated by a central heating and cooling plant similar to a VAV system where capacity is distributed to each room via piping systems compared to an air distribution system. While more adaptable to a prototype building, the piping system will need to be uniquely designed for each varying building size. The unit is recirculating air type, which it heats or cools to satisfy the room thermostat.

A separate decoupled mechanical ventilation air system or Dedicated Outdoor Air System (DOAS) is necessary to precondition all the outside air required by code. The unit utilizes heat recovery devices to precondition outside air as well as provide free reheat in the cooling mode, heating and cooling coils, filters, and supply and relief fan to distribute the minimum amount of outside air to each space.

Water Source Heat Pumps: Water source heat pumps are similar to the fan coil unit system and are more decentralized as the heating and cooling is generated by the self-contained refrigeration system in each unit. A central 2-pipe condenser water system limits the minimum and maximum temperature range using supplemental boilers, cooling towers, and/or earth heat exchanger for heating and heat rejection. Since individual units can provide heating or cooling, there is inherent heat recovery when some units are cooling while other units are heating. As a result, a free cooling winter water economizer system is not required. While using a supplemental heat source, it typically is still considered an all (heating and cooling) electric energy source system. Since the individual heat pump units generate their own heating and cooling capacity, there is no large central heating and cooling plant (boilers and chillers) that will change in size and capacity. However, it does utilize supplemental heating and heat rejection equipment or earth heat exchanger. Not all building sites are conducive to a geothermal system, depending on limitations of the site and/or geology. A water based heat pump system still requires supplemental heat and heat rejection equipment or earth heat exchanger, thus limiting consistency in initial cost and possibly how the system is designed (all geo, hybrid geo, no geo).

APPENDIX A | CONSULTANT RECOMMENDATIONS

MECHANICAL, ELECTRICAL, AND PLUMBING RECOMMENDATIONS (Continued)

Variable Refrigerant Volume/Flow (VRV/VRF): A VRV or VRF system is an all refrigerant based air source (optional water source) heat pump system, therefore water distribution piping, pumps, and associated equipment (boilers, chillers, cooling towers) are not required and the need for mechanical equipment rooms/penthouses for HVAC equipment is optional.

The system is essentially an all-electric air source heat pump system in which multiple indoor fan coil units can be manifolded to a common outdoor condensing unit. The proposed system is considered heat recovery since any indoor fan coil unit can be controlled to heat or cool at any time, similar to a 4-pipe central plant or 2-pipe water source heat pump system.

The system is very efficient and requires minimal infrastructure space since energy is transported to individual rooms by the variable speed compressor through refrigerant piping. A VRV/VRF system is the most decentralized system and most adaptable for prototype buildings. It is not dependent upon site conditions. Additionally, it does not utilize a central heating or cooling plant, central air distribution system, central piping distribution system and minimizes the amount changes to these systems from one site to another. It is more modular in design being decentralized such as building area increases or decreases, these independent systems can be added or removed from site to site.

Similar to the fan coil system and water source heat pump system, the VRV/VRF system provides heating and cooling to the space, but not ventilation air. A DOAS unit is required to provide mechanical ventilation. The DOAS unit in this application is typically a packaged cooling, gas-fired heating rooftop unit with heat recovery.

Hybrid System: A Hybrid system can utilize a combination of system alternatives. For example the office/admin suite and perhaps Media Center where summer cooling is required could be served by an Air Source VRF/VRV system where individual space temperature control is required. Large assembly type spaces such as the Gym and Cafeteria could use standard packaged gas fired rooftop units which would allow independent operation for nights, weekends, summer use while only requiring a single thermostat for temperature control. For typical educational spaces (classrooms and associated support areas) that only operate during the school year and not evening and weekends, a high efficiency, longer life expectancy water based system (water source/geothermal heat pumps or 4 pipe central plant) could be implemented. The hybrid system would add some complexity of different types of equipment and systems within the building but may provide cost advantages (construction and operating) and operational flexibility that may be desirable.

APPENDIX A | CONSULTANT RECOMMENDATIONS

MECHANICAL, ELECTRICAL, AND PLUMBING RECOMMENDATIONS (Continued)

3. Plumbing:

a. General

A complete system of plumbing will be provided throughout the building to comply with the requirements set forth in the program and installed in strict accord with all applicable codes and regulations, including ADA.

The plumbing systems will consist of but not be limited to:

- Domestic Cold Water
- Domestic Hot Water with Recirculation
- Sanitary Drainage and Vent
- Storm Water Collection including Footing Ground Water Collection
- Natural Gas
- Fire Protection

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

b. Water Service

The building will be served by a new 6 inch minimum combined domestic and fire protection service. Backflow preventers shall be provided for both domestic water and fire protection incoming water services. A flow test is required to determine if a fire pump will be needed to serve the sprinkler system.

New hot and cold water will be extended to and serve the fixtures and equipment as required. All domestic water piping will be copper Type L with wrought copper fittings and lead-free solder. The domestic water system will comply with NSF61 to be certified as lead free. All water piping shall be insulated with the exception of non-handicapped final branch run-outs for connection to fixtures/equipment.

Backflow preventers and vacuum breakers will be provided to prevent back siphonage and contamination of the potable water system.

Freezeproof wall hydrants will be located every 150 feet along the building's perimeter. Hose bibbs in concealed boxes will be located in gang toilet and shower rooms and kitchen areas which require washdown.

APPENDIX A | CONSULTANT RECOMMENDATIONS

MECHANICAL, ELECTRICAL, AND PLUMBING RECOMMENDATIONS (Continued)

c. Domestic Hot Water

Multiple water heaters will be located in the Boiler Room. Hot water will be generated by a natural gas, high efficiency water heater. The Kitchen will receive 140 degree hot water while all other areas will receive 105 degree F hot water. ASSE 1070 temperature limiting valves shall be provided at all public fixtures.

d. Sanitary Drainage

A new sanitary drainage system serving the new plumbing fixtures will be sized per the requirements of the American Society of Plumbing Engineers, the local County Plumbing Code, and the International Plumbing Code. The new sanitary drain line will be extended 5'-0" beyond the outside wall and connected under another division.

e. Storm Water Drainage

The Storm Water System will be sized per the requirements of the American Society of Plumbing Engineers, the local county Plumbing Code, and the International Plumbing Code. The new storm water system line will be extended 5'-0" beyond the outside wall and connected under another division.

f. Natural Gas

A new natural gas service from the local utility company and associated piping will be provided to meet the comfort heating, domestic water and kitchen equipment requirements.

g. Fire Protection

The Building will be protected by means of a wet pipe sprinkler system. Sprinkler systems will be in strict accordance with all local and state codes as well as the International Codes and NFPA. A backflow preventer will be provided to prevent backflow of this make-up water into the potable water system. All zone valves will be located in a dedicated valve room. Mains for each zone will originate in the valve room and will be routed to their associated fire protection zone. A flow test is required to determine if the municipal system has ample volume and/or pressure. If not, a supplemental tank may be required for volume and/or a fire pump will be needed to provide the required pressure.

APPENDIX A | CONSULTANT RECOMMENDATIONS

MECHANICAL, ELECTRICAL, AND PLUMBING RECOMMENDATIONS (Continued)

C. Building Automatic Temperature Controls/Energy Management System

1. General

For renovation and replacement building options it is recommended that the building be provided with a web-based Direct Digital Control (DDC) Automation System and be tied into the County Central Johnson Controls Energy Management System (EMS). It is recommended that the entire system utilize direct digital controls, including space terminal unit controls. All controls shall be electric/electronic actuation. All controls and monitoring points shall be consistent with the County's current standards and shall be reviewed with the Facilities Department during the design phase.

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

The Basic Design Criteria will be as follows:

- a. Cooling Mode:
Outdoor Temperature: 95°F DB, 78°F WB
Indoor Temperature: 75°F DB, 65% RH or less
- b. Heating Mode:
Outdoor Temperature: 10°F DB
Indoor Temperature: 70°F DB
- c. Chilled Water System (at 95°F Ambient):
45°F Supply Water Temperature
60°F Return Water Temperature
- d. Heating Water System (at 10°F Ambient):
140°F Supply Water Temperature
120°F Return Water Temperature

APPENDIX A | CONSULTANT RECOMMENDATIONS

MECHANICAL, ELECTRICAL, AND PLUMBING RECOMMENDATIONS (Continued)

e. Ventilation Rates (ASHRAE Standard 62-2016):

- Offices: 5 CFM per person + 0.06 CFM/SQFT
- Classrooms: 10 CFM per person + 0.12 CFM/SQFT
- Media Center: 10 CFM per person + 0.12 CFM/SQFT
- Art Rooms: 10 CFM per person + 0.18 CFM/SQFT
- Cafetorium: 7.5 CFM per person + 0.18 CFM/SQFT
- Gymnasium: 20 CFM per person + 0.18 CFM/SQFT
- Auditorium: 5 CFM per person + 0.06 CFM/SQFT

f. Water Source Heat Pump:

Standard Loop: 70°F to 90°F Supply Water Temperature

Geothermal Loop: 40°F to 90°F Water Temperature

2. Central Heating Plant

The building central heating system shall be energized to operate whenever outside air temperatures are 65°F or less. When indexed on, the distribution pump shall be energized and vary its flow through the variable speed controller to maintain its system differential pressure set-point.

Through sequencing software the boilers shall be staged in lead-lag fashion to maintain system supply water set-point. Boiler lead-lag control shall be rotated through the sequencing software. Automatic isolation valves shall open or boiler circulating pumps shall energize to allow water flow through active boilers.

The heating water temperature supply shall be reset (linear type) based on outside air temperature.

3. Central Chilled Water Plant

The building central chilled water system shall be energized to operate whenever outside air temperatures are 55°F or above. When activated, the chiller(s) and its associated chilled water pump shall be energized, and vary its flow through variable speed controller to maintain its system differential pressure set-point.

APPENDIX A | CONSULTANT RECOMMENDATIONS

MECHANICAL, ELECTRICAL, AND PLUMBING RECOMMENDATIONS (Continued)

4. Air Handling Units

For Variable Flow Variable Temperature Single Zone Air Handling Units, a room temperature sensor will modulate the associated air handling units' cooling coil valve and outside air economizer controls to provide the necessary cooling. When heating is required, the room thermostat first modulates the unit's hot water preheat coil valve. If additional heat is required, the thermostat shall modulate the unit's heating coil valve in series with the preheat coil valve. Additionally, the supply fan shall vary in flow from 50%-100% in both cooling and heating modes.

For Variable Air Volume (VAV) Air Handling Units, a supply duct temperature sensor sensing the discharge air temperature shall modulate preheat coil valve or chilled water valve in conjunction with air economizer control to maintain constant supply air temperature of 55°F. Duct static pressure sensors strategically located downstream in the supply duct shall vary supply air fan speed to maintain its set-point. The return air fan speed will vary so as to maintain a constant volumetric difference between supply air and return air; (i.e., fan tracking). An air flow measuring station will be used to monitor and control minimum outside air for ventilation.

For Dedicated Outdoor Air Systems (DOAS) units, a heat recovery device shall be utilized to precondition outside air using the energy from the exhaust air stream. When operating in a cooling mode, supply air will be sub-cooled and dehumidified to 55°F and reheated, via a sensible only heat recovery device, up to 75°F to prevent sub-cooling. In a heating mode, supply air will be heated to 70°F or higher.

All air handling units will be provided with safety features such as low limit control, freeze stat, supply and return air smoke detectors, and high static pressure sensors (for variable air volume units only). All air handling units, except for DOAS units, will be provided with energy conservation features such as air economizer cycles, night setback, and morning warm-up cycles of operation.

5. Terminal Control Units

Terminal Variable Air Volume Terminal Units will be controlled by room temperature sensors. The room temperature sensors will modulate the quantity of supply air flow from minimum to maximum via an internal modulating damper. When heat is required, the room thermostat shall modulate the terminal room unit's heating coil valve and supply air damper in unison.

Fan-Coil Units will be controlled by room temperature sensors. Supply air to the space will be constant. Cooling coil and heating coil control valves shall modulate varying supply air temperature to maintain room temperature setpoint.

Heat Pump Units will be controlled by room temperature sensors. Supply air to the space will be constant. Reversing valves shall be positioned to either heating or cooling and the compressor will cycle to maintain room temperature set-point. Each unit will have an open-close control valve that will allow water flow whenever the compressor is energized.

APPENDIX A | CONSULTANT RECOMMENDATIONS

MECHANICAL, ELECTRICAL, AND PLUMBING RECOMMENDATIONS (Continued)

II. ELECTRICAL SYSTEM RECOMMENDATIONS

A. UTILITIES:

1. Normal Power Distribution: It is recommended to increase the capacity and size of the incoming service to be a 2000A, 277/480 Volt, 3-Phase, 4-Wire Panelboard to accommodate any future additions or loads that may be added. Branch panelboards should also be replaced since they are either at or approaching their recommended lifespans.
2. Emergency Power Distribution: It is recommended that provisions to accept a secondary source of power should be implemented. Two automatic transfer switches (ATS's) for life safety and non-life safety loads should be installed to enable critical loads to remain running during an outage. For the secondary source of power, it is recommended that an emergency generator be installed, but a docking station that could accept power from a roll-up generator is an acceptable replacement.

B. ELECTRICAL SYSTEMS:

1. Lighting: It is recommended that all lighting fixtures be replaced with new LED-Type fixtures. Lighting controls should be added to allow customizable dimming and occupancy/vacancy sensing capabilities and to meet current energy codes. The overall efficiency of the building will increase with the change to LED fixtures.
2. Fire Alarm System: The fire alarm system seems to be in good condition and meet ADA requirements, as it was installed in 2018.
3. Security System: Security cameras around the perimeter and in the office are in good condition and properly cover the perimeter of the building, therefore we see no need to upgrade security.
4. Access Control System: The card reader and Aiphone seem to be in good condition. Owner may want to consider adding card reader to other entrances for accessibility.
5. Master Clock System: The existing Latham Master Clock System is in fairly decent condition. If desired, digital clocks could be installed throughout the building, which may require a new master clock system.
6. Voice Network – Telephone / Paging / Intercom System: The cabling for the data network is fairly up-to-date to incorporate the new security and smartboard technology that was installed.